RE-ENGINEERING
AND
FLEXI SYSTEMS

MBA [System Management]

Paper 4.2

ALAGAPPA UNIVERSITY

Karaikudi - 630 003 Tamil Nadu, India

Reviewer	
Dr. V. A. Anand	Assistant Professor Department of Logistics Management Alagappa University, Karaikudi

Authors

Dr Archana Mahamuni, Assistant Professor, IILM Institute for Business Management Gurgaon

Aditi Sharma, Freelance Author

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SYLLABI-BOOK MAPPING TABLE

Re-engineering and Flexi Systems

Syllabi	Mapping in Book
UNIT 1 **Concept and Requisites of BPR and Flexi System:** Nature, Significance and Rationale of Business Process Reengineering (BPR)-Fundamental Rethinking is Fundamental of BPR-The Genesis-Requisites: Reengineering Leader, Reengineering Communications, Reengineering Journey, New Process Design, Reengineering Failure, Reengineering Team, Reengineering Effort, Reengineering Program, Reengineering Will-Speed and Smart Execution- Concept and Significance of Flexibility- Flexible Vs Fixed systems- Features and superiority of Flexible systems.	**Unit 1:** Concept and Requisites of BPR and Flexi System **(Pages: 3-21)**
UNIT 2 **Process Reengineering:** Appraisal of Processes-Processes for Reengineering-Reengineering of Processes-Role of information technology-BPR Cycle: Identify, Analyze As-Is, Envision New Processes- Business process discovery and diagnosis-Design/Re-design/Reconstruction-Test and Implement-Monitor-Business process interoperability-Business process Improvement-Business process mapping-Process Reengineer-BPR Process and Participants.	**Unit 2:** Process Reengineering **(Pages: 23-44)**
UNIT 3 **Implementing BPR:** Approval of BPR- Preparations for Implementation-BPR Process Chart-Change Management-Communication, Commitment, Control and Contours-Reengineering Reporting-Systems Thinking-Reengineering Enabling Processes-Continuous Improvement-Bottom-up Participation Process-BPR Principles.	**Unit 3:** Implementing Business Process Reengineering **(Pages: 45-62)**
UNIT 4 **Evaluation of PBR:** Reengineering Success-Reengineering Revolution-BPR Vs TQM; BPR Vs CQI; BPR Vs Scientific Management; BPR Vs Industrial Engineering; BPR Vs Value Engineering-BPR Criticisms-BPR Can do well.	**Unit 4:** Evaluation of PBR **(Pages: 63-94)**
UNIT 5 **Types of Functional Flexi Systems:** Simplifying systems-Enterprise Flexibility: Ready for Experimenting and coping with Paradoxes-Strategic Flexibility: Ready for Change and Dynamics-Organizational Flexibility: Fluidity and Managing by Walking around-Financial Flexibility-Marketing Flexibility-Human Resources Flexibility-Information System Flexibility-Manufacturing system Flexibility-Supply Chain Flexibility.	**Unit 5:** Types of Functional Flexi Systems **(Pages: 95-124)**
UNIT 6 **Components and Competitiveness of Flexi Systems:** Flexibility in Technology-Flexibility in Product offerings-Flexibility in service offerings-Flexibility in Business Excellence-Flexibility in Mergers and Acquisitions-Flexibility in Strategic Alliances-Competitive Edge and Flexi Systems.	**Unit 6:** Components and Competitiveness of Flexi Systems **(Pages: 125-152)**

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INTRODUCTION

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In a volatile global world, organisations enhance competitive advantage through business process re-engineering (BPR) by radically redesigning selected processes. BPR implies transformed processes that together form a component of a larger system aimed at enabling organisations to empower themselves with contemporary technologies, business solutions and innovations.

BPR, which is a multi-dimensional tool, utilises several methods to examine processes from a holistic perspective, transcending the narrow borders of specific functions.

The most effective BPR teams include active representatives from the following work groups: top management, business area responsible for the process being addressed, technology groups, finance, and members of all ultimate process users' groups. Team members who are selected from each work group within the organization will affect the outcome of the reengineered process according to their desired requirements.

This book, *Re-engineering and Flexi Systems* is divided into six units. These units discuss the concept and requisites of BPR and Flexi system. The essentials of process reengineering and the implementation process of BPR along with its evaluation is explained in detail in this book.

This book follows the self-instruction mode wherein each Unit begins with an Introduction to the topic of the unit followed by an outline of the Unit Objectives. The detailed content is then presented in a simple and structured format interspersed with Check Your Progress questions to test the student's understanding. A detailed Summary and a set of Questions and Exercises are also provided at the end of each unit for effective recapitulation.

UNIT 1 CONCEPT AND REQUISITES OF BPR AND FLEXI SYSTEM

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1.0 INTRODUCTION

Business Process Reengineering (BPR) is an important mechanism to make organizations more efficient and up to date. BPR is a paradigm that is used by many organizations to survive in today's competitive market. It involves rethinking, restructuring and redesigning processes to achieve significant improvements in performance, effectiveness and streamlining processes with organizational business strategy. It transforms an organization in various ways that directly affect overall performance.

Today, organizations are exposed to emerging concerns, customers' changing taste, expecting a high-quality product, and competition across the globe. They take different shapes to keep their position in the global market and stay alive. Many organizations have to choose either to fail or doing fundamental changes in many aspects including their processes which are known as BPR. Through BPR, organizations carry fundamental changes in order to get dramatic improvement in the critical success factor. BPR pursues multiple improvement goals such as quality, cost, flexibility, outcome, innovation and accuracy.

Creative design and flexi systems of the business processes are a critical phase and the organization should prepare the ground for innovation in this phase. They help organizations to use the BPR concept efficiently. BPR pursues multiple improvement goals such as quality, cost, flexibility, outcome, innovation and accuracy.

Nowadays, organizations emphasize on innovation, flexibility, efficient quality service, delivery and cost effective re-engineering business methods and supporting processes to develop smart and highly target-oriented BPR tools and methodologies. It can also work as a decision support tool that is utilized throughout the business process cycle from the initial design stages to implementation and process monitoring and control stages.

This unit brings in a comprehensive overview of Business Process Reengineering concepts and models and presents a business process redesign framework and its flexi systems.

1.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Define Business Process Reengineering (BPR)
- Understand the concept of BPR
- Analyze the nature, significance and rationale of BPR
- Explain the genesis and requisites of BPR
- Understand the various faces of reengineering in BPR
- Describe BPR's smart execution in the organization
- Understand reengineering programme and effort
- Explain the concept and importance of flexibility
- Understand the features and superiority of air flexible systems

1.2 BUSINESS PROCESS REENGINEERING (BPR): AN OVERVIEW

Every business organization has certain objectives like increasing market share, profit maximization or customer satisfaction. Whenever any business organization attempts to satisfy its customers' needs, it uses many processes across its functional departments like operations, marketing, purchase and finance, etc. Every functional department and process within the organization always tries to contribute its part in fulfilling customer needs.

For example, video production and the television programme companies are creating two types of 'products'. Within the organization, both of these products involve a slightly different mix of processes. An organization chooses to re-organize its operations process so that each product is produced from start to finish by a standard process which contains all the elements necessary for its production process.

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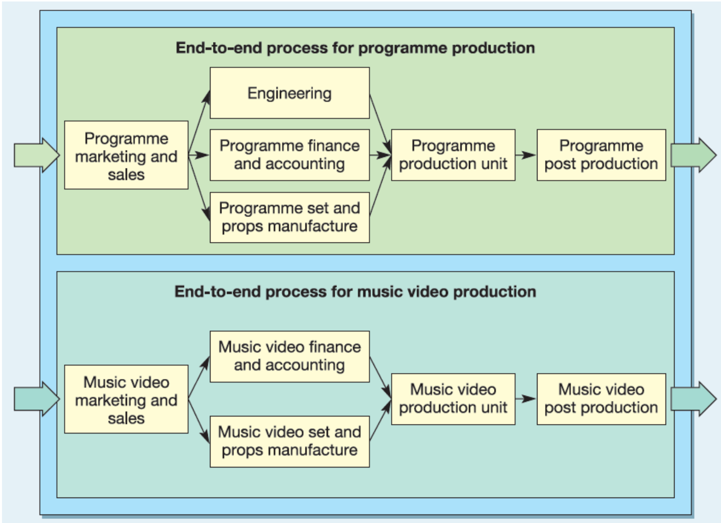


Fig 1.1 *The Video and Television Organization Divided into Two 'end-to-end' Business Processes; First is Dedicated to Producing Programs and the other one is Dedicated to Producing Music Videos*

As shown in the above figure, customer needs for each product are entirely satisfied from within which is called an 'end-to-end' business process. These processes frequently cut across conventional boundaries of organizational set up. Reorganizing (also called as 're-engineering') process boundaries and streamlining the organizational responsibilities around these various business processes form the bedrock of the philosophy behind business process re-engineering (BPR).

1.2.1 BPR in Indian and Global Context

Given its relevance in today's competitive environment, it is apt to discuss BPR in Indian context. In India, there are numerous leading organizations from various sectors of industry which have implemented BPR process. These are, Mahindra & Mahindra, Bank of India, ICICI Bank, to name a few. These examples are discussed and elaborated in relevant context. In global context, companies like Hallmark, Merrill Lynch, Mutual Benefit Life, Ford, Bell Atlantic, General Electric Company (GE), Insurance Company, Taco Bell, and American Hospital Supply Corporation (AHSC), are some of the reputed names of several American companies which had improved their performance dramatically in one or several of their business areas by radically changing the ways in which they used to work. Earlier, these organizations continued with the business which they were doing. However, they have significantly changed or wherever necessary replaced the processes which they were following in their businesses. In few cases, these companies were assisting their clients to develop some new techniques in order to survive in the competitive environment.

1.2.2 Concept of BPR

Michael Hammer, in late 1990, was the first who introduced the concept of BPR in a Harvard Business Review article. A few years later, when these two authors, Michael Hammer and James Champy, who are closely associated with reengineering, published their best-selling book, *Reengineering the Corporation*, it increased attention for the BPR concept.

Reengineering the Corporation shows how it is important to forget about business traditions and invent a new, process-focused business organization that leads to better performance. In their book, the authors explain how you can use your knowledge to develop a new organization that is as optimal as possible. By re-engineering the rules of business, you will be able to gain a true competitive advantage. The authors promoted the idea that sometimes it is necessary for an enterprise to enhance the quality of service and lower the costs due to radical redesign and reorganization. For this, radical change in information technology is the key enabler.



Fig. 1.2 *BPR: Radical Change and Process Improvement*

Business process is a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization. (Thomas H. Davenport, 1993).

Business Process Reengineering: BPR involves the radical redesign of core business processes to achieve dramatic improvements in productivity, cycle times and quality.

Business Process Reengineering contains implicitly two parts. These are:

- Business process
- Reengineering

Business process can be defined as the task or activities which are logically related and which are used to achieve as definite business goal. Re-engineering can be defined as the basic or fundamental rethinking and radical redesign of various business processes in order to achieve dramatic improvements in critical and contemporary measures of performance.

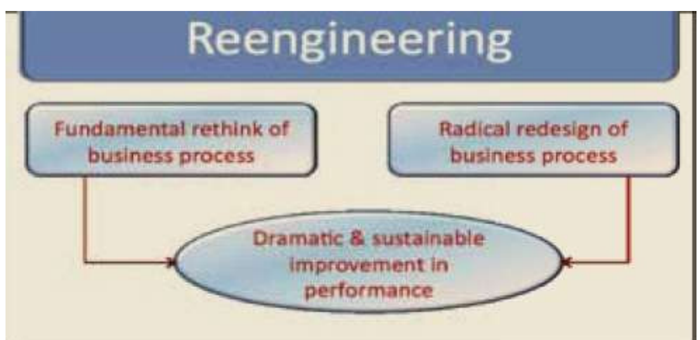


Fig. 1.3 *The Facets of Reengineering*

According to Hammer and Champy (1993), 'Reengineering is the fundamental rethinking and radical redesign of business process to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and

speed.' Hammer and Champy also highlighted how the transition or changes in world of work could happen from conventional system to business process reengineering.

Changes in the World of Work

From Conventional	To BPR
Functional departments	Process Teams
Simple tasks (division of labor)	Empowered employees
Controlled people (by management)	Multidimensional work
Training of employees	Education of employees
Compensation for skill and time spent	Compensation for results
Pay raises based on promotions and seniority	Low pay plus high performance-related bonuses
Advancement based on ability	Advancement based on performance
Protective organizational culture	Productive organizational structure
Managers supervise and control	Managers coach and advise
Hierarchical organizational structure	Horizontal (flat) structure
Executives as scorekeepers	Executives as leaders
Separation of duties and functions	Cross-functional teams
Linear and sequential processes	Parallel process
Mass production	Mass customization

SOURCE: Based on Hammer and Champy, 1993.

1.2.3 Characteristics and Significance of BPR

Some of the characteristics of BPR are:

1. Inputs, (data such as customer inquiries or materials)
2. Processing of the data or materials (which usually go through several stages and may necessary stop those that turn out to be time and money consuming)
3. Outcome (the delivery of the expected result)

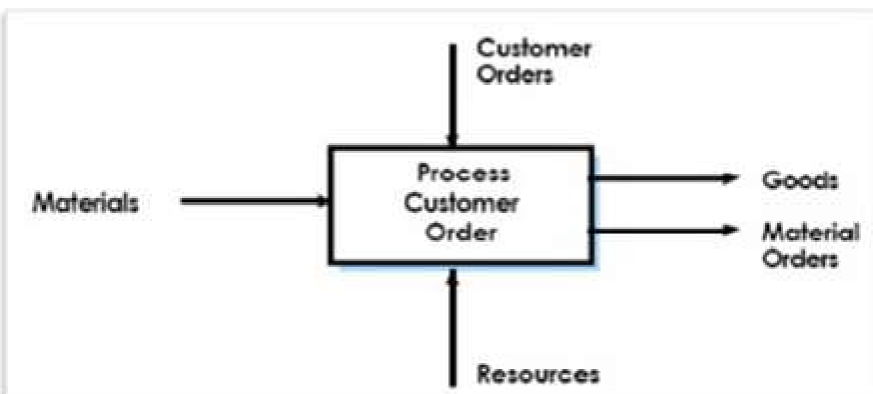


Fig. 1.4 Customer Order Process

Significant features of BPR are:

- It focusses on fundamental rethinking and radical redesigning of business processes
- It has also focussed on the customers

- It strives towards converting 'function oriented organisation' to 'process oriented organisation'
- Information Technology (IT) is the key enabler in the process

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1.3 FUNDAMENTAL RETHINKING IS FUNDAMENTAL OF BPR

Hammer and Champy (1993) define business process reengineering (BPR) and explain, 'The fundamental rethinking and radical redesign of the business processes are to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed'. Beckman further expanded this definition as 'the fundamental rethinking and radical redesign of an entire business system to achieve dramatic improvements in critical, measures of performance, and customer value.'

Above definitions invole four most important concepts of reengineering. These are as follows:

1. **Fundamental rethinking:** Organization has certain assumptions and biases. The rethinking process basically gives challenges to existing assumptions and biases and further strives to reformulate the business strategy. Also, it challenges the perspective towards existing customer, and market.
2. **Radical redesign:** It indicates creative thinking, creating an innovative design by using Information Technology, creative thinking and best practices across the industry.
3. **Entire business system:** Entire business system does not only focus on improving the process but also redesigning the components such as product, service, technology, management, workforce and expertise in various domains.
4. **Dramatic improvement:** It focuses mainly on achieving the gains which are measurable and will be at least 50 per cent in customer value and overall organizational performance.

Check Your Progress

1. What do you mean by business process reengineering (BPR)?
2. List some names of organizations which have implemented BPR process.
3. Who was the first author to introduce the concept of the BPR?
4. List some of the characteristics of BPR.
5. Which are the four most important concepts of reengineering?

1.4 THE GENESIS AND REQUISITES OF VARIOUS ASPECTS OF REENGINEERING

Let us analyse the various requisites of various aspects of reengineering.

1.4.1 Reengineering Leader

Economic downturn, globalization, fierce competition and various challenges faced by an organization demands the dynamic leadership. For a successful business process reengineering (BPR) effort, the right leadership is an essential prerequisite.

Reengineering leader is one of the pre-requisites of the BPR. The leader should possess the following traits as mentioned below:

- The reengineering team's leader should be preferably from the top management, with sound technical knowledge.
- The leader should possess requisite skills and personality traits required for the assigned job.

- Also the team leader should be able to handle covert or overt resistance from various levels of employees in the organization.
- The leader should support in the reengineering effort by keeping a track and performing project reviews time to time.
- A strong, committed, aggressive and knowledgeable leadership is essential for successful BPR.

According to Dr. John Chamberlin (2010), the reengineering leader must be a senior manager or an executive who should be passionate and should have strong commitment about reengineering. Also reengineering leader should have an authority to implement the necessary changes which are essential to support major process and redesign. Most of reengineering failures occur due to breakdowns in leadership.

1.4.2 Reengineering Communications

In order to ensure the success of a business process reengineering program, several factors are essential. Among them, one of the crucial factor is corporate communications. Within organizational changes, communication aspects have received larger attention since the advent of business process reengineering.

Following are the fundamentals of corporate communications in the implementation of BPR process. These are as follows:

- There has to be a clear communication within the organization
- Clear communication should exist while doing documentation
- Communication documents should convey the goals of the business process reengineering initiatives
- Communication documents should also convey the roles and responsibilities of the participants in the process
- Appropriate corporate communication should reduce the afore-mentioned resistance during BPR implementation process

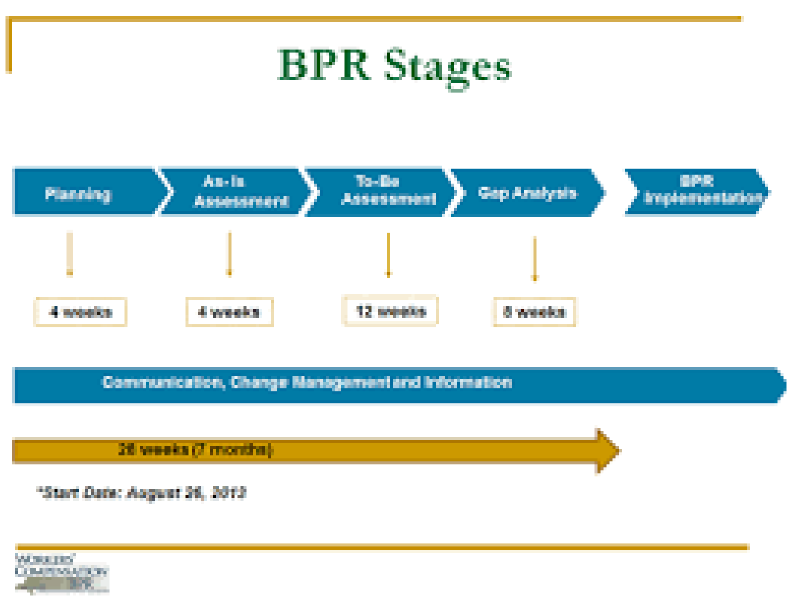


Fig. 1.5 Business Process Reengineering Stages

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1.4.3 Reengineering Journey

In reengineering process, the business organization has to take a journey from the known or familiar to the unknown process.

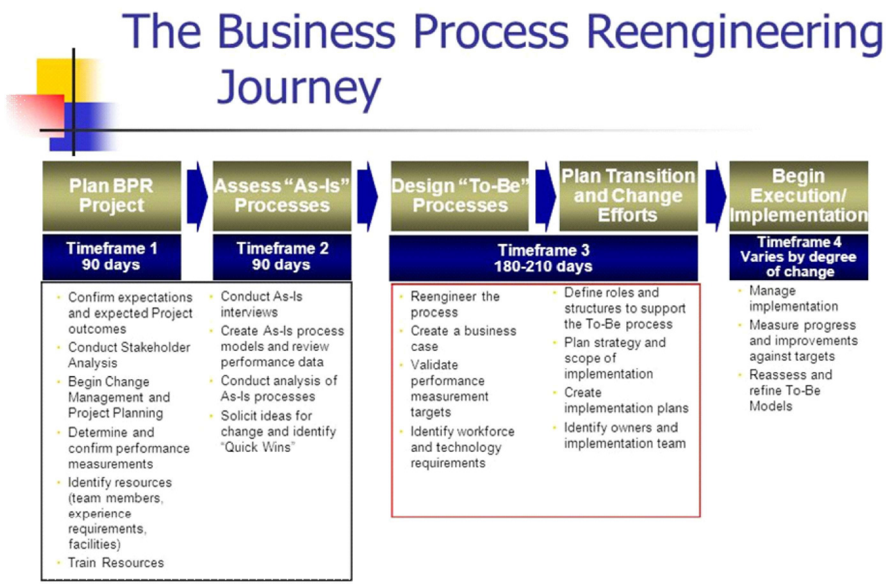


Fig. 1.6 *The Business Process Reengineering Journey*

As shown in the above diagram, the journey begins with defining the time frame, planning of BPR project which includes conforming to the expected project outcomes, identifying resources like team members, their experience requirements and facilities required. It also conducts stakeholder analysis.

Further step in the journey is Assess 'As-Is' Processes. This process begins with conducting 'As-Is' interviews and creating 'As-Is'process models. After model creation performance, data is reviewed and 'As-Is' processes analysis is conducted. Ideas for change are solicited and 'Quick Wins' are identified.

Design "To-Be" Processes is the next step to "As-Is" Processes. After validating performance measurement targets, appropriate workforce and technology requirements are identified.

Further step in the journey is Plan Transition and Change Efforts: In order to support the "To-Be" process, roles and structures are well defined. Strategy is planned and scope of implementation is also identified. After creating implementation plans, both owners and implementation team are identified.

Last step in this journey is Begin Execution/Implementation. Implementation is managed. Progress and improvements are measured against targets. If necessary "To-Be" models are re-assessed and refined.

1.4.4 New Process Design

Business process re-engineering (BPR) suggests that businesses need to radically restructure their existing organizational processes in order to achieve their objectives, goals and be successful in the endeavours. Some of the ways to new process design are:

- For radical restructure, businesses may be needed to eradicate some of their existing processes and start new process from scratch.
- New process design is part of the redesign stage in which new process design is developed by creativity techniques, devising process design alternatives, and through brainstorming.
- New process design is a crucial step in business process reengineering. Continuous improvement during process design and searching for better process solutions are the key elements for BPR success.

1.4.5 Reengineering Failure

Let us have a comprehensive view on various factors of BPR that can lead to the failures. According to Peppard and Fitzgerald (1997), ambitious objectives, creative problem solving teams, process oriented approach and integration of technology with the process are considered as the primary success factors for BPR initiatives.

In the past, along with success few organizations have witnessed failures of BPR processes.

Following are the factors due to which failures may occur in BPR implementation:

- Lack of financial resources, lack of support from the top management, crisis in the organization, resistance from the staff, lack of vision, emphasizing more on cost reduction.
- There are other failure factors like fixed or rigid process which are non-flexible to be compatible with changes or new developments.
- Absence of a process perspective, lack of employee involvement in the decision making processes, technological limitations, absence of project management efforts.
- Lack of strong leadership, poor performing teams, downsizing, and communication gap within cross functional teams and among the hierarchies can also lead to failure of BPR implementation.
- Managers' personal problems like arrogance, lack of pre-requisite skills, and incompatibility could also lead to the failure.

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1.4.6 Reengineering Team

Reengineering team plays a very crucial role for successful implementation of BPR. A process reengineering endeavour should begin with the formation of a cohesive team of people who could drive the reengineering effort.

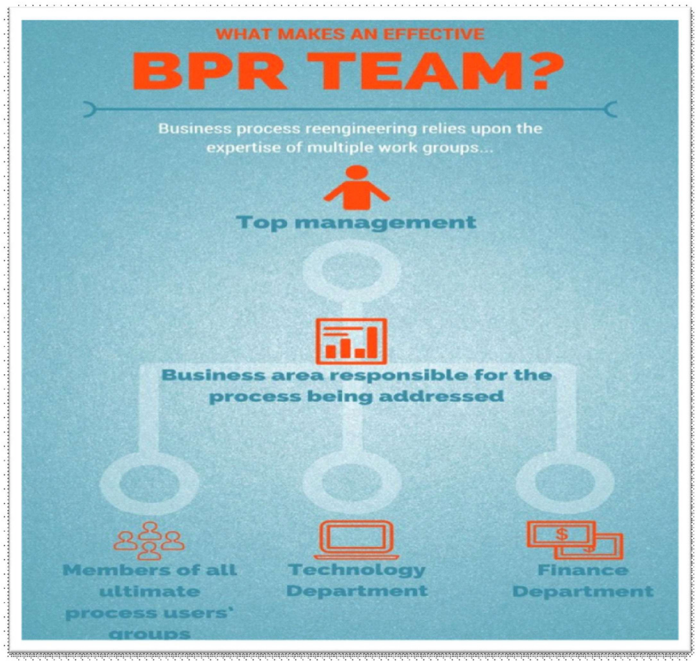


Fig. 1.7 *Making of a BPR Team*

There are some factors which need to be considered when designing a team and selecting the members. These are as follows:

- There has to be an interim team which can take responsibility for looking at the necessity for reengineering implementation.
- Team should be able to manage the process reengineering efforts from the beginning to the end.
- Team members assigned should be either on a full time or part time basis.
- Team members should be selected on the basis of their knowledge, experience and level of authority, for the process being reengineered.
- The senior management team must put regular effort in guiding and monitoring the activities of all the reengineering projects carried out in the company.
- The decision regarding the structure and size of the team is taken on the basis of the scope of the process being reengineered.
- There are two broad options available while formulating a reengineering team. Those are:
  - o **Core team:** The core team is a small team which consists of three or four members who have strong commitment toward reengineering and who can devote full or nearly full time for reengineering effort. As and when required, other members can be added to the core team.

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- o **Full team:** The full team is a bigger than a core team which consists of eight to twelve or even more members. Team comprises of members involved in the process as well as process suppliers and customers. Team members are selected on the basis of their ability to make a specific contribution to the team and they should remain as a part of team till the reengineering effort continues.

1.4.7 Reengineering Efforts

As discussed above, business process reengineering comprises the radical redesign of core business processes to attain significant improvements in quality, productivity, and cycle times. In Business Process Reengineering, companies begin the process with a sheet of paper, rethink and redesign the existing processes to deliver superior value to the customer. An effort taken during this process is called as "reengineering efforts."

Let us understand this with an example:

The reengineering efforts are very well illustrated by reengineering of procurement at Ford. Without modern information technology, Ford's changes would not have been possible.

For example, in the Ford's reengineered procurement process, when goods are arriving without the on-line database of purchase orders, receiving clerk could not have authorized vendor payments. Rather in absence of the database for a receiving clerk, it could have been an uphill task to match the goods which Ford had actually ordered.

Theoretically, purchasing could have sent a photocopy of every purchase order to every receiving document in the company, and then receiving clerks could have checked arriving goods against this photocopy. However, such a paper-based system would prove impractical. Technology has enabled Ford to create a radically new mode of operation for the procurement process.

1.4.8 Reengineering Programme

Success of reengineering programme is two-fold:

- Enhancing customer satisfaction performance
- Engross business development without a corresponding linear development in expenses

BPR and Six Sigma claim that enhancing customer satisfaction performance starts with determining and fulfilling both customer-and market-driven service level agreements, which include quality and timeliness.

A company cannot accomplish the performance breakthroughs that reengineering promises without investing in its reengineering program. The most significant component of this investment is the time and attention of the company's best people.

To discuss more in detail about reengineering program, a company called Aetna Life and Casualty initiated reengineering programme with a set of actions that have nothing to do with process redesign.

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Some of the takeaways from this programme were:

- While developing BPR program, new organizational structure has been created which emphasized on the autonomy of key business units.
- This program eliminated cross subsidies and new senior management team has been created.
- Program also carried out a significant reduction costs with optimum utilization of resources.

1.5 CONCEPT AND SIGNIFICANCE OF FLEXIBILITY

In a highly global, technological and competitive environment, the flexibility to response to the changing market needs and creating an innovative cross functional processes are highly essential to achieve success.

There is a need to emphasize on the fact that, in order to succeed in BPR, the firm must create an organizational structure change from a hierarchical to a flat form, in line with the management objectives. Goals must change from being functional sub optimized to global optimization, process oriented measurement, and employees' work in the organization should change from being fragmented to team oriented.

It is significant that the firm should integrate core business process reengineering and holistic outsourcing and rethink its business from an integrated, systematic "whole" and value chain viewpoint to beat competition with flexibility and innovation.

1.5.1 Flexibility: Need to Develop Flexi System

It is necessary to develop flexi structures and adaptive processes for dynamic conditions and fierce competition. Company should develop tough points in order to form awareness mechanism to capture weak points and modify the plan to cope up with dynamic marketing environment.

In business processes, there are diverse score measure on notions of flexibility. To define flexibility, it is capability of adjusting with changing environment or to cope up with dynamic market.

1.5.2 Salient Features of Flexibility

Some of the salient features of flexibility are as follows:

- An extensive literature shows the importance of flexibility within BPR.
- Flexibility within BPR is an approach which examines flexibility in other business functional areas, such as manufacturing, information systems, operations, architecture, and organizational strategy.
- A form of 'flexibility analysis' is adopted as a stage in BPR projects.
- Flexibility analysis also ensures analysis of the different kinds of changes that might be essential over a period of time, and how these different changes could be accommodated during reengineered processes. Understanding of flexibility could be clearer with flexibility diagram.

Check Your Progress

6. What role does reengineering leader play in the BPR?
7. List the fundamentals of corporate communications in the implementation of BPR process.
8. What do you mean by reengineering journey?
9. How does a Reengineering Team play a crucial role in BPR?
10. What do you understand by 'reengineering efforts'?
11. List the two factors responsible for the success of reengineering program.

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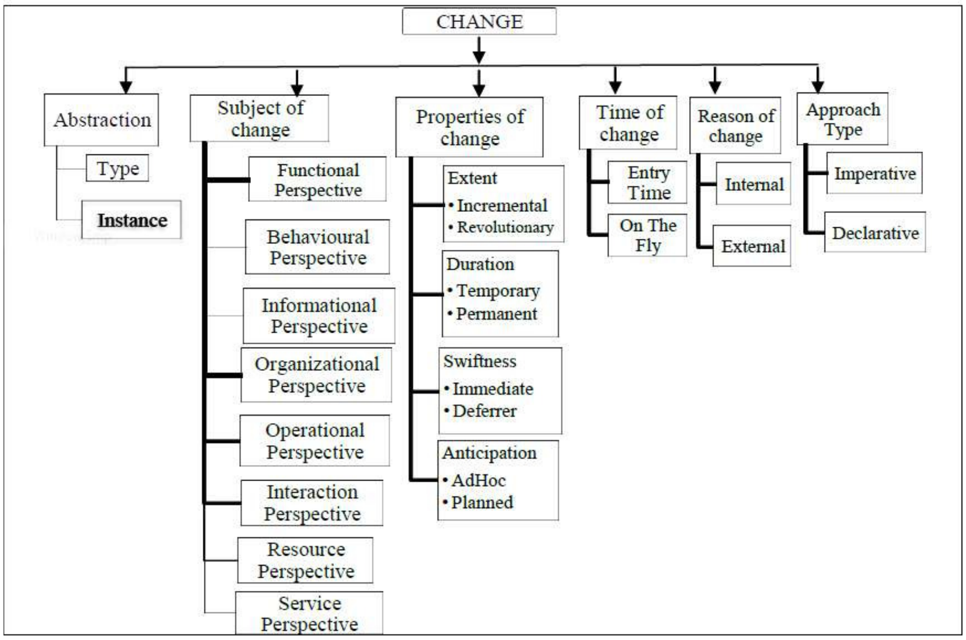


Fig. 1.8 *The Taxonomy of Flexibility*

1.5.3 Taxonomy of Flexibility

Flexibility taxonomy comprises six orthogonal dimensions:

- The abstraction level of the modification
- The subject of change
- The properties of the change, (duration, anticipation, swiftness, which embrace extent)
- Time of modification
- Various reason of modification and
- Type of Approach

The need for process **flexibility** confirms that there has to be a "fit" between actual business processes carried out and the technologies which support them are maintained in dynamic environments.

Discussion on the flexibility revolves around the issues, challenges and approaches to amendment throughout the execution. The table below provides journey of flexibility analysis over some recent years.

Flexibility: Flexibility is used as an attribute of various types of systems. In the field of engineering systems design, it refers to designs that can adapt when external changes occur.

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Table 1.1 Journey of Flexibility Analysis over Some Recent Years

Sr. No	Flexibility	Year	Description	Scope/limitation/Problem
1.	By configuration /selection [13]	1999	Supports preventive treatment of changes; reduces need for change	Workflow language needs to be extended by application specific constructs
2.	By adaptation [13] *(A-posteriori)*	2000	Supports follow up treatment of changes	Requires controlling
3.	By design [14] *(A-priori)*	2007	Alternative execution paths at design time selection of the most appropriate execution path to be made at runtime	Limited to Design time only
4.	By underspecification [14]	2007	Execute an incomplete process model at run-time	Initial Model specification is must
5.	By deviation [14]	2007	Instance to deviate at runtime other than planned at design time; only order change allowed	No other option other than reorder
6.	By change [14]	2007	Modify a process model at run-time such that one or all of the currently executing process instances are migrated to a new process model	Too many standard solution available to choose for a single issue
7.	Pre Flexibility [15]	2006	Which is anticipated by the designer and forms part of the process definition	Scope to design time and designer form
8.	Just-In Time [15] responsive	2006	requires an "intelligent process manager" to deal with the variation as it arises at runtime	Can't be used without intelligent process manager
9.	Short term Flexibility [16]	2005	This type involves a temporary deviation from the standard way of working,	Limited to instance
10.	Long Term Flexibility [16]	2005	This involves changes to the usual way of working	No standard approach defined and explained
11.	Type flexibility [17]	2007	It arises from the diversity of information being handled	Can be utilized if information is geographical located in different places
12.	Volume Flexibility [17]	2007	It arising from the amount of information types	Depends and relates to only amount of information
13.	Structure flexibility [17]	2007	It arising from the need to operate in different ways	Limited to graphs only
14.	Meta_model flexibility [18]	2011	changes are applied to workflow definitions and are propagated to workflow running instances	method needs complex propagation mechanisms and consistency checks
15.	Open_point flexibility [18]	2011	special points are defined in a workflow model where adaptation can be made either by selecting one path from alternatives or creating a new one	Open points have to be identified in advance and included in the process definition

The above table indicates journey of flexibility over the years and also shows types of flexibility-its role, limitation and scope in re-engineering process.

1.5.4 Flexible vs Fixed Systems

The pros and cons of flexible and fixed systems are:

- Fixed system is inflexible and does not change with the actual volume of output achieved. Flexible system can be suitably re-casted quickly according to level of activity attained.
- Fixed system assumes that conditions would remain static. Flexible system is designed to change according to changed conditions while reengineering.
- Fixed system has a limited application and is inefficient as a tool for cost control during reengineering process. Flexible system has more application and can be used as a tool for cost control.
- In fixed system, the assessment of actual and forecasted performance cannot be done appropriately if capacity of output differs. Assessments are realistic as the changed plan figures are replaced against actual ones.

- In fixed system, it is difficult to forecast the result accurately. Flexible system clearly indicates the impact of various activities on the operational aspects of the business.

1.5.5 Features and Superiority of Flexible Systems

NOTES

- The flexibility concept is often observed in terms of an organization's processes ability and supportive technologies to adapt to dynamic environment changes.
- From the opposite perspective, an alternate advanced view is that flexibility should be considered i.e. in terms of elements that stay the same and not what has changed.
- However, a process can only be considered to be flexible in nature if it is possible to change it without needing to replace it entirely.

  Hence, to sum-up, flexibility is an effective balance stability and change which ensures that the uniqueness of the process remains the same.

1.6 SUMMARY

- Business Process Reengineering (BPR) is a paradigm that is used by many organizations to survive in today's competitive market. It involves rethinking, restructuring and redesigning processes to achieve significant improvements in performance, effectiveness and streamlining processes with organizational business strategy.
- Through BPR, organizations carry fundamental changes in order to get dramatic improvement in the critical success factor. BPR pursues multiple improvement goals such as quality, cost, flexibility, outcome, innovation and accuracy.
- Whenever any business organization attempts to satisfy its customers' needs, it uses many processes across its functional departments like operations, marketing, purchase and finance, etc.
- An organization chooses to re-organize its operations process so that each product is produced from start to finish by a standard process which contains all the elements necessary for its production process.
- Given its relevance in today's competitive environment, it is apt to discuss BPR in Indian context. In India, there are numerous leading organizations from various sectors of industry which have implemented BPR process. These are, Mahindra & Mahindra, Bank of India, ICICI Bank, to name a few.
- Michael Hammer, in late 1990, was the first who introduced the concept of BPR in a Harvard Business Review article. A few years later, when these two authors, Michael Hammer and James Champy, who are closely associated with reengineering, published their best-selling book, *Reengineering the Corporation,* it increased attention for the BPR concept.
- Business process can be defined as the task or activities which are logically related and which are used to achieve as definite business goal. Re-engineering can be defined as the basic or fundamental rethinking and radical redesign of various business processes in order to achieve dramatic improvements in critical and contemporary measures of performance.

Check Your Progress

12. What role does flexibility play in BPR?
13. List some of the features of flexibility.
14. What are the dimensions of taxonomy of flexibility?
15. Enumerate the pros and cons of flexible and fixed systems.

NOTES

- Hammer and Champy also highlighted how the transition or changes in world of work could happen from conventional system to business process reengineering.
- Economic downturn, globalization, fierce competition and various challenges faced by an organization demands the dynamic leadership. For a successful business process reengineering (BPR) effort, the right leadership is an essential prerequisite.
- In order to ensure the success of a business process reengineering program, several factors are essential. Among them, one of the crucial factor is corporate communications. Within organizational changes, communication aspects have received larger attention since the advent of business process reengineering.
- Design "To-Be" Processes is the next step to "As-Is" Processes. During this, reengineer the process, create a business case is carried out. After validating performance measurement targets, appropriate workforce and technology requirements are identified.
- Reengineering Team plays a very crucial role for successful implementation of BPR. A process reengineering endeavor should begin with the formation of a cohesive team of people who could drive the reengineering effort.
- BPR and Six Sigma claim that enhancing customer satisfaction performance starts with determining and fulfilling both customer- and market-driven service level agreements, which include quality and timeliness.
- It is necessary to develop flexi structures and adaptive processes for dynamic conditions and fierce competition. Company should develop tough points in order to form awareness mechanism to capture weak points and modify the plan to cope up with dynamic marketing environment.

1.7 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Business Process Reengineering (BPR) is an important mechanism to make organizations more efficient and up to date. BPR is a paradigm that is used by many organizations to survive in today's competitive market. It involves rethinking, restructuring and redesigning processes to achieve significant improvements in performance, effectiveness and streamlining processes with organizational business strategy.
2. Hallmark, Merrill Lynch, Mutual Benefit Life, Ford, Bell Atlantic, General Electric Company (GE), Insurance Company, Taco Bell, and American Hospital Supply Corporation (AHSC) are some of the organizations which have implemented the BPR.
3. Michael Hammer, in late 1990, was the first who introduced the concept of BPR in a Harvard Business Review article.
4. Some of the characteristics of BPR are:
   - Inputs (data such as customer inquiries or materials),
   - Processing of the data or materials (which usually go through several stages and may necessary stop those that turns out to be time and money consuming)
   - Outcome (the delivery of the expected result)

5. The four most important concepts of reengineering are:
    - Fundamental Rethinking
    - Radical Redesign
    - Entire Business System
    - Dramatic Improvement
6. Economic downturn, globalization, fierce competition and various challenges faced by an organization demands the dynamic leadership. For a successful business process reengineering (BPR) effort, the right leadership is an essential prerequisite.
7. Following are fundamentals of corporate communications in the implementation of BPR process. These are as follows:
    - There has to a clear communication within the organization.
    - Clear communication should exist while doing documentation.
    - Communication documents should convey the goals of the business process reengineering initiatives.
    - Communication documents should also convey the roles and responsibilities of the participants in the process.
    - Appropriate corporate communication should reduce the afore-mentioned resistance during BPR implementation process.
8. In reengineering process, the business organization has to take a journey from the known or familiar to the unknown process. The journey begins with defining the time frame, planning of BPR project which includes conforming to the expected project outcomes, identifying resources like team members, their experience requirements and facilities required. It also conducts stakeholder analysis.
9. Reengineering Team plays a very crucial role for successful implementation of BPR. A process reengineering endeavour should begin with the formation of a cohesive team of people who could drive the reengineering effort.
10. In Business Process Reengineering, companies begin the process with a sheet of paper, rethink and redesign the existing processes to deliver superior value to the customer. An effort taken during this process is called as 'reengineering efforts.'
11. Success of reengineering program is two-fold:
    - Enhancing customer satisfaction performance
    - Engross business development without a corresponding linear development in expenses.
12. In a highly global, technological and competitive environment, the flexibility to response to the changing market needs and creating an innovative cross functional processes are highly essential to achieve success.
13. Some of the features of flexibility are:
    - An extensive literature shows the importance of flexibility within BPR.
    - Flexibility within BPR is an approach taken which examines flexibility in other business functional areas, such as manufacturing, information systems, operations, architecture, and organizational strategy.

- A form of "flexibility analysis" is adopted as a stage in BPR projects.
- Flexibility analysis also ensures analysis of the different kinds of changes that might be essential over a period of time, and how these different changes could be accommodated during reengineered processes.

14. Flexibility taxonomy comprises six orthogonal dimensions:
    - The abstraction level of the modification
    - The subject of change
    - The properties of the change, (duration, anticipation, swiftness, which embrace extent)
    - Time of modification
    - Various reason of modification
    - Type of Approach
15. The pros and cons of flexible and fixed systems are:
    - Fixed system is inflexible and does not change with the actual volume of output achieved. Flexible system can be suitably re-casted quickly according to level of activity attained.
    - Fixed system assumes that conditions would remain static. Flexible system is designed to change according to changed conditions while reengineering.
    - Fixed system has a limited application and is inefficient as a tool for cost control during reengineering process. Flexible system has more application and can be used as a tool for cost control.
    - In fixed system, the assessment of actual and forecasted performance cannot be done appropriately if capacity of output differs. Assessments are realistic as the changed plan figures are replaced against actual ones.
    - In fixed system, it is difficult to forecast the result accurately. Flexible system clearly indicates the impact of various activities on the operational aspects of the business.

1.8 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate in brief the evolution of Business Process Reengineering (BPR) in organizations.
2. State BPR's role in enhancing the performance of an organization.
3. State how some of the organizations in India and abroad benefited from replacing or reengineering the processes.
4. Define the term 'reengineering' and briefly state the changes in the world of work from conventional to BPR.
5. Write a short note on various aspects of reengineering.
6. Enumerate the success of reengineering programme.
7. State the features and superiority points of flexi systems.

Long-Answer Questions

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1. Explain in detail the concepts and rationale of Business Process Reengineering (BPR).
2. Discuss how BPR has become indispensable for organizations to stay competitive and relevant today.
3. Elaborate the characteristics and features of BPR.
4. Explain fundamental rethinking and its role in incorporating BPR in any organization.
5. Describe in detail about the impact of Reengineering Leader for a successful BPR effort.
6. 'In reengineering process, the business organization has to take a journey from the known or familiar to the unknown process.' Explain the statement with various examples.
7. Analyze the need and significance of flexibility for a successful BPR in an organization.

UNIT 2 PROCESS REENGINEERING

NOTES

Structure

2.0 Introduction
2.1 Unit Objectives
2.2 Understanding Appraisal of Processes, Processes for Reengineering and Reengineering of Processes
 2.2.1 Reengineering Process
 2.2.2 Appraisal of Processes
 2.2.3 Reengineering of Processes
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2.4 Business Process Reengineering (BPR) Stages and Methodologies
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 2.4.2 Design, Redesign and Reconstruction Stage
2.5 Business Process Reengineering (BPR) Cycle
 2.5.1 Identifying Processes
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 2.5.3 'To-be' Process and its Role
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2.7 Business Process Improvement
 2.7.1 Objectives of Business Process Improvement
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 2.8.1 Salient Features of Process Mapping
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2.11 Answers to 'Check Your Progress'
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2.0 INTRODUCTION

Conventional work processes run the risk of weighing down or slowing down the company's growth. It, therefore, becomes imperative for those at the helm to restructure or re-engineer accordingly. Sometimes radical redesigning and reorganizing an enterprise becomes necessary to lower costs, increase productivity and improve the quality of service. Organizations have been grappling with complex work processes that impact productivity, one way or the other. Re-engineering the work processes has made a significant contribution to productivity.

The workforce is one critical input in this re-engineering process. More often, poor processes, confusing role definitions or unclear responsibilities have a snowballing effect on individual productivity, in turn affecting the entire group or system. Hence, it is pre-requisite on the part of the human resources manager to understand what creates complexity for most employees and tailor work accordingly, discarding whatever that does not add value and channeling work to employees who can handle the intricacies effectively.

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Process improvement comes from analyzing and re-engineering work processes to eliminate unnecessary steps and save time that instead could be used for other productive purposes. Making the workforce understand and comply with the simplified processes aids in the smooth functioning of the system as they remove unnecessary layers and controls. Innovative processes that bridge time and enhance productivity should be the focal point. Companies use different processes for reengineering across its functional departments. Companies like Ford have decided to implement BPR and information technology to radically change its process of accounts payable.

This unit aims at explaining the whole gamut of processes associated with reengineering and apprises you about numerous organizations which have simplified their processes according to the needs of business process reengineering (BPR) and witnessed dramatic performance and critical success.

2.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Discuss the concept of process reengineering
- Understand the concept of appraisal of processes
- Explain the role of information technology
- Understand the concept of BPR Cycle
- Understand business process discovery and diagnosis
- Explain the design/re-design/reconstruction in the BPR
- Understand business process interoperability, improvement and mapping
- Analyze BPR process and participants

2.2 UNDERSTANDING APPRAISAL OF PROCESSES, PROCESSES FOR REENGINEERING AND REENGINEERING OF PROCESSES

Let us begin by explaining what process and business process are. A process is defined as a cross-functional interconnected series of activities that convert inputs into outputs.

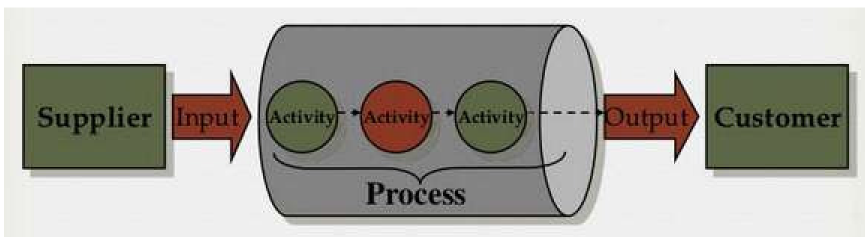


Fig. 2.1 *Process as a Cross-sectional Activity*

A business process is a group of logically related tasks or group of activities that use the firm's resources to create value to a customer in support of the organization's objectives. Example of a customer order entry is shown below.

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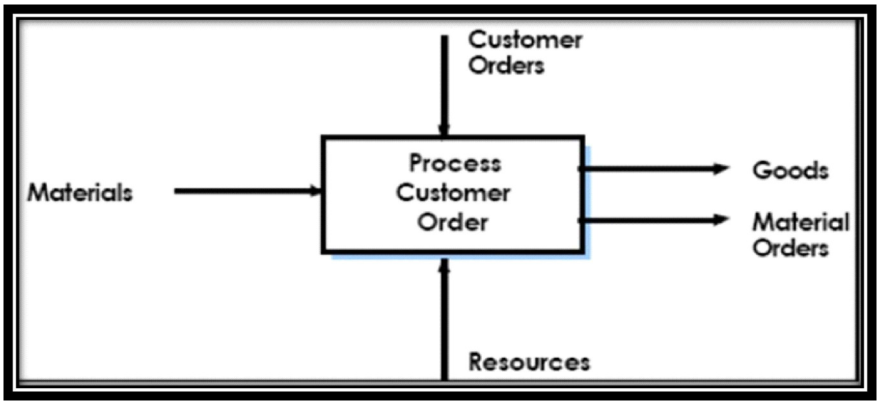


Fig. 2.2 *Customer Order Entry*

2.2.1 Reengineering Process

Business Process Reengineering (BPR) do not change geographies, functions, departments or tasks. It changes processes. To discuss in detail, reengineering is not about reorganizing or downsizing, it is all about redesigning an organization's business processes.

Redesigning focuses on the organizational structure which is designed in such way that it best supports redesigned business processes. It also focuses on rethinking, eliminating unnecessary work and finding more efficient ways of working. There are numerous businesses which have successfully implemented BPR. Ford's Accounts Payable Process is one such example about BPR implementation. Before BPR implementation, Ford's accounts payable process was quite slow and cumbersome as they had not implemented BPR.

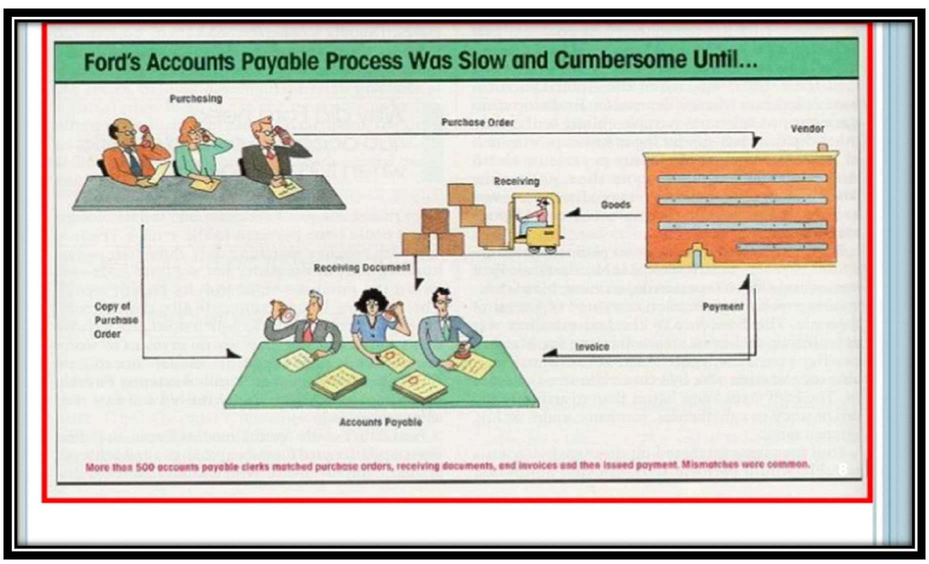


Fig. 2.3 *Ford's Accounts Payable Process*

Ford's purchase department initially sends a purchase order for procurement of raw materials to the vender. A copy of the purchase order also sends to the accounts payable department. The vendor raises an invoice to the accounts payable department after sending the raw materials.

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The accounts payable department tallies the purchase order, received raw materials and invoices and then makes payments to the supplier. For this entire process, Ford employed about 500 people to handle the process, whereas it's major competitor, Mazda, a Japanese car manufacturer has managed the same process with 100 people, a remarkably low number of employees.

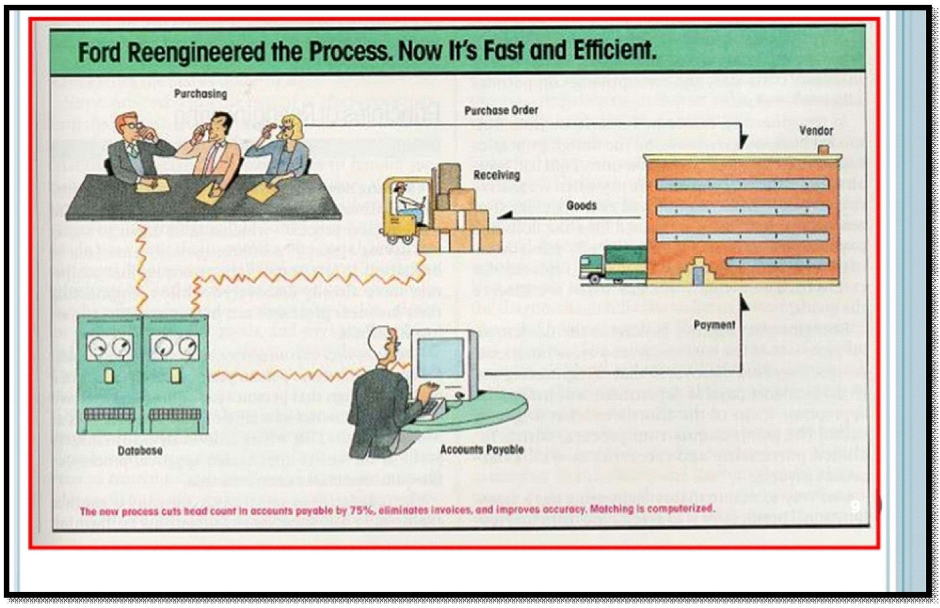


Fig. 2.4 *Ford Reengineered the Process*

After implementation of BPR, instead of making minor changes to the business processes, Ford has decided to implement BPR and Information Technology (IT) to radically change its process of accounts payable. To start with, it has implemented an invoice-less process. The purchasing order is raised by the purchasing departments and updated in the database maintained in the company. The moment when materials have been received in the warehouse, the concerned person from warehouse would update the materials received. Since it is updated in the database, the payment will be automatically made to the vendor, without waiting for the invoice to be received from the vendor. Hence, through redesign in the business process, Ford had achieved a 75% remarkable reduction in employees in the administration department.

2.2.2 Appraisal of Processes

As seen above, business process consists of a combination of number of independent and interrelated processes such as new product development, customer order processing, or it could be bill payment system.

The structural elements which constitute a process provide a basis for its analysis, appraisal and redesign. This could lead to achieving higher levels of efficiency, economy, effectiveness, output, speed and quality.

As discussed in previous unit, Business Process Reengineering is a dramatic change initiative that comprises five major steps that managers should appraise. These are as follows:

- Refocus company values on customer satisfaction
- Redesign core business processes, using information technology to enable improvements in the processes
- Reorganize a business into cross-functional teams and define end-to-end responsibility for each process
- Rethink about basic organizational and employee challenges
- Improvement in business processes across the organization

2.2.3 Reengineering of Processes

In BPR, numerous process are involved as business process re-engineering (BPR) believes that there is a necessity that business should radically restructure its core business processes in order to achieve organizational goal and succeed in the long-term. Implementation of BPR can show dramatic developments in productivity, cycle times and quality of product and services. The reengineering process achieves its goal in the following ways:

- In reengineering process, a company starts with a blank sheet of paper and tries to rethink its existing business processes to deliver superior value to the customer.
- Normally, they adopt a new enhanced value system that places increased emphasis on customer needs and value proposition.
- Companies make an effort to decrease business layers and eradicate unproductive activities in mainly two key areas.
  - o They redesign functional organizations into cross-functional teams.
  - o They use updated technology to increase data dissemination and proper decision making.

2.2.4 Processes for Reengineering

Companies use different processes for reengineering across its functional departments. Let us discuss various processes for reengineering for manufacturing company. Manufacturing company could have the processes like cycle times, supply chain management, inventory control, quality improvement, defect minimization, etc. Some of the processes are discussed below.

a. **Reduction in cost and cycle times**: Reengineering methodology reduces different costs. It also reduces cycle times by eradicating unproductive activities performed by the employees during the operation. Reorganization of teams decreases the need for management layers, accelerates information flows and eliminates the errors, rework caused by multiple handoffs.

b. **Quality improvement**: Quality is very significant aspect in every organizational process and for final product and services. Reengineering processes enhance the quality in work by reducing the fragmentation of work. Clear ownership of processes is created. Hence workers are responsible for their output and they can measure their performance based on prompt feedback.

Check Your Progress

1. Why is the process of reengineering necessary for an organization today?
2. How is the process movement brought in the organization?
3. What role does redesigning play in the organizational structure?
4. List the major steps that managers should appraise for the BPR implementation.
5. Name some of the processes of reengineering.

2.3 ROLE OF INFORMATION TECHNOLOGY

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Information Technology plays a very crucial role in business process reengineering. It is an essential enabler in reengineering efforts. It is a major enabler for new ways of working.

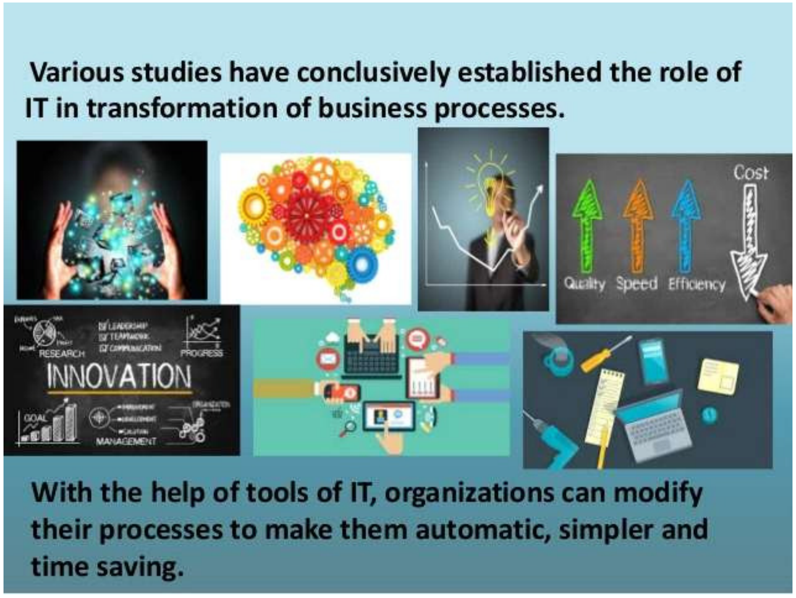


Fig. 2.5 *Role of IT in the Transformation of the Business Process*

Information Technology plays its role in the following ways:

- Information technology collaborates the work within an organization and across organization.
- Disruptive technologies were identified which were challenging for traditional wisdom regarding how work should be accomplished.
- Decision-making becomes relatively easy with decision-support tools as it becomes a part of everybody's job.
- Telecommunication networks are strengthening and leveraging organizations to be centralized and decentralized at the same time.
- Due to shared databases, information is available at various places. Systems are expert which allow generalists to perform specialist tasks in organization.
- Advancement in wireless data communication and portable computers /Laptops are assisting field personnel to work office as independently.

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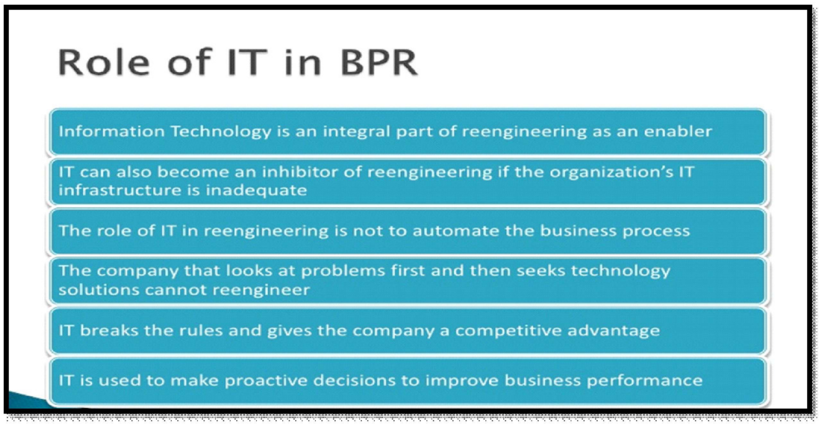


Fig. 2.6 *Role of IT in BPR*

2.3.1 Impact of Information Technology

Information technology has a very positive impact while implementing BPR. IT improves efficiency, effectiveness. It also facilitates transformation.

a. **Impact of IT on Individual:** IT industry has come a long way to its current shape where it is playing a very dominant role in our every sphere of life. Also the chance of human errors that could occur when things are done manually could also be avoided provided the programs are developed keeping in mind the exact requirements that are sought after and developed properly to address the issues correctly without problems.

Efficiency	Task mechanization	Word processing Spreadsheet
Effectiveness	Work improvement	Using database to generate sales letters
Transformation	Role expansion	Doing what if analysis for investment client

Fig. 2.7 *Impact of IT on Individual*

b. **Impact of IT on Functional Unit:** The use of information technology has dramatically increased the availability of information on product movement in the distribution channel.

Efficiency	Process automation	Order entry, credit checking
Effectiveness	Functional enhancement	CAD, CAM
Transformation	Functional redefinition	CD ROM disks for business research

Fig. 2.8 *Impact of IT on Functional Unit*

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c. **Impact of IT on Organization:** Organizations use Information Technology systems to perform various tasks. Some use IT to provide for the basic processing of transactions, while others enable customers, distributors and suppliers to interact with the organization through various communication technology systems.

Efficiency	Boundary extension	Linking customers and suppliers
Effectiveness	Service enhancement	Online diagnostics databases
Transformation	Product innovation	videoconferencing

Fig. 2.9 *Impact of IT on Organization*

From the above figure, it is clear that, Information Technology has a very positive impact on individual, functional unit and organization.

Some more examples are mentioned below which indicate that Information Technology is an enabler in BPR.

1. **Kodak Case:** This is an example of reengineering in the product development process. Kodak has created product development process in response to a competitive challenge. Kodak's old product development process before reengineering was partly parallel and partly sequential but entirely slow. The company could develop in various ways. These are as follows:



Fig. 2.10 *Kodak Products*

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- Kodak has reengineered its product development process through computer-aided design (CAD)/ computer-aided manufacturing (CAM). It was an innovative use of a technology during that time.
- This innovative use of technology allows design engineers to design at computer workstations instead of at drafting design on papers. Working at computer screen instead of on drawing paper would have made the design engineers individually more productive.
- The technology which empowered Kodak to reengineer its product development process is an integrated product design database.
- Every day each engineer's work is collected by this database and it combines all the individual engineer's efforts into a coherent whole. Each morning, individuals as well as design groups inspect the design database to check whether someone else's work done yesterday has created a problem for design process.
- In such case, instead of after weeks or months of wasted work, team tries to resolve the problem immediately. This technology allows design engineers to start their tool design in just ten weeks. As soon as the product design engineers give the first prototype of some shape after validation, development process starts.
- New process implemented by Kodak is called concurrent engineering. It has been used widely in the automotive industries and aerospace. Also, it is now starting to attract adherents in consumer goods companies.
- Kodak utilized concurrent engineering to reduce nearly in half i.e. to thirty-eight weeks the time required to move the 35mm, single-use camera from concept design to mass production.
- Moreover, the reengineered process allows tooling design engineers to get involved before product design is finished. Kodak's expertise was tapped to produce a design that is easily and economically manufactured.
- To discuss in terms of cost, Kodak has reduced its manufacturing and tooling costs for the single-use camera by 25 percent. In the Kodak case, company believed its problem was pushing design engineers to work quicker so that succeeding design steps might start at the earliest. Company's technology solution virtually eliminated the need for successive design.
- In the case of Kodak, they believed their problem was pushing design persons to work quicker so that subsequent design steps could start earlier. Their technology solution virtually eradicated the need for successive design.

2. **Ford's Account Payables Case:** As discussed above, their managers thought their challenge was to find a technique for processing vendor invoices faster and with fewer people. What they found instead was solutions that allow them entirely do away with invoices.
3. **Another case is IBM:** Its credit's executives believed their challenge was how to speed the information movement among various groups of experts. Information technology permitted the company to eradicate the experts so that information should not move around at all.

NOTES

Most companies commit the fundamental error that they look at the new technology capabilities to improve or streamline their existing process. Instead, they should focus on thinking how to we use technology to do the things which they are not doing currently.

Reengineering is about exploiting the latest capabilities of technology to achieve entirely new goals it is about innovation.

These examples of Ford, IBM and Kodak depict requisite characteristics of reengineering efforts. Examples which are cited also fulfill the definition of reengineering that is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as quality, service, and speed, and cost.

2.4 BUSINESS PROCESS REENGINEERING (BPR) STAGES AND METHODOLOGIES

Most reengineering methodologies share common elements. However, modest differences can have a substantial impact on the success or failure of a project. As the project area has been identified, reengineering business processes methodologies may be used.

A company which is targeting to apply for reengineering first selects the best methodology, sequence processes and then implement the appropriate BPR plan. It also has to create effective and actionable visions. All methodologies can be divided in the following 'general' stages.

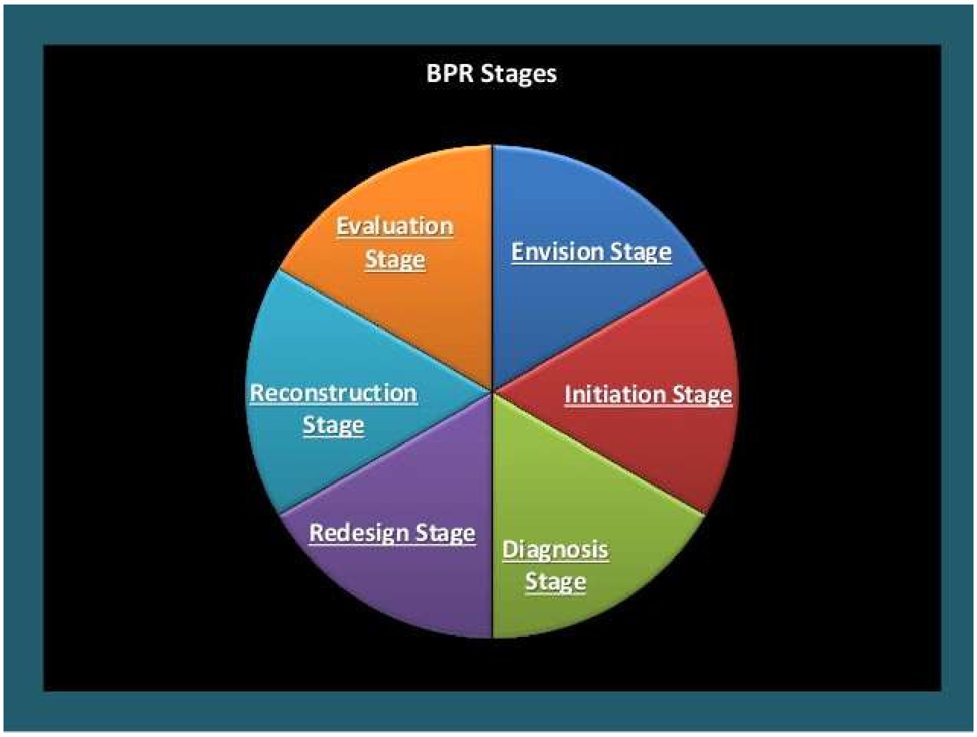


Fig. 2.11 *BPR Stages*

2.4.1 New Processes: Envision, Discovery and Diagnosis

Let us analyse the concept of envision, discovery and diagnosis of new processes.

Envision

- In an envision stage, the company analyses the existing business processes and strategy.
- This is based on the review, the business processes, which required improvement, are identified.
- After the identification related information technology, opportunities are reviewed.

Business Process Discovery and Diagnosis Stage

- In initiation stage, project teams are assigned and allocation of work has been done.
- Along with project planning and employee notification, the performance goals are identified.
- In discovery and diagnosis stage, the main documentation and sub-documentation take place.
- Documentations prepared are in terms of physical attributes like what are the various activities planned?; what are the resources used?; how the communication flow is and what is the role of an individual in team?
- Finally, IT requirement are defined and cost associated with these all activities are calculated.

2.4.2 Design, Redesign and Reconstruction Stage

- In redesign stage, through brainstorming and creativity techniques, new process design is developed by finding and devising process design alternatives.
- Followed by new process design, management technique changes occur which ensures smooth migration to the new process responsibilities and each individual's role in a team is identified.

Evaluation Stage

- The new process implemented is monitored.
- Continuous evaluation is carried out to determine if goals are met.
- Total quality management programs are examined.

2.5 BUSINESS PROCESS REENGINEERING (BPR) CYCLE

Davenport (1990) defined BPR as 'a set of logically related tasks performed to achieve a defined business outcome.' Reengineering focuses on a holistic approach on business objectives and how processes are related to them, encouraging full-scale recreation of processes rather than iterative optimization of sub-processes.

Check Your Progress

6. How is Information Technology an enabler in reengineering effort?
7. How does IT impact on individual and organization?
8. How is Kodak's product development process an example of reengineering?
9. List some of the companies which carry reengineering efforts.
10. List the stages of BPR methodologies.

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Business Process Reengineering (BPR) is about the analysis and design of workflows and processes within an organization. BPR is also known as business transformation, business process redesign, or business process change management.

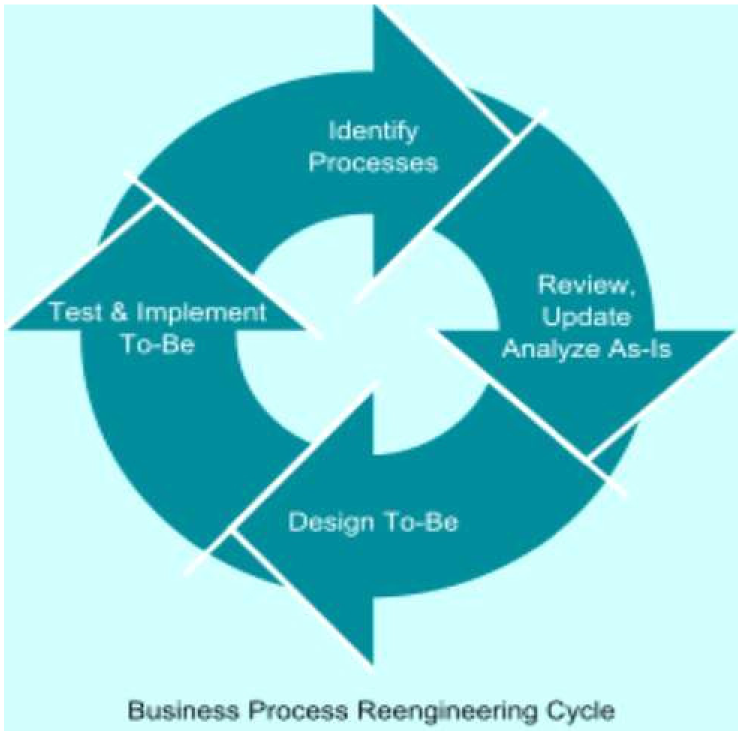


Fig. 2.12 *Business Process Reengineering Cycle*

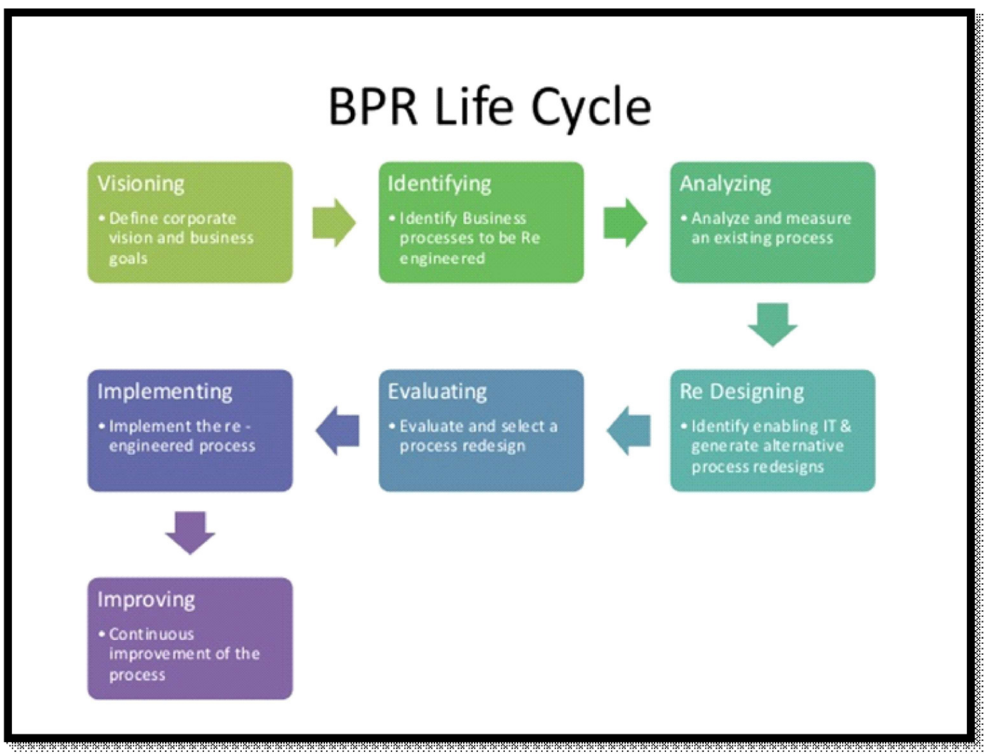


Fig. 2.13 *BPR Life Cycle*

2.5.1 Identifying Processes

In the process of reengineering, first activity is to get prepared for reengineering through planning and preparation. Planning and preparation are both vital factors for any activity or process to be successful. Before attempting reengineering process, necessity for reengineering should be identified. Once significant need is identified, a cross-functional team is recognized and appropriate plan for the process of reengineering is established. It is also important to find the gap between the expectations of the customer and existing business processes, which falls short of meeting those customer requirement. Based on customer expectations, vision and mission statements are formulated. Business strategy and customer requirements are reviewed and finally, core processes are selected.

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2.5.2 Analyzing 'As-Is' Process

- "As-Is" or "Current State" is to understand how things are done currently. Reengineering team should understand the existing process before they advance to redesign the process.
- "As-Is" business process defines the existing state of the business process in an organization.
- The imperative aspect of BPR is that the improvement should provide dramatic results.
- The key objective of "As-Is" process is to identify gaps in terms of activities which prevent the process from achieving desired results.

2.5.3 'To-Be' Process and its Role

- In "To-Be" process, more alternatives are produced to the current situation or current process in order to achieve goals of an organization.
- Benchmarking is the first phase in this process; it is compared with the best practices followed in the relevant peer organization. Primary objective of benchmarking is to understand and evaluate the existing processes in organization by comparing with the best practice in other relevant organization. It also identifies different areas and means of potential performance improvement.
- The several "To-Be" models that are arrived are validated. Followed by validation, **Trade- off** Analysis is performed and then best possible "To-Be" scenarios are selected for implementation.

Trade off: A trade-off (or tradeoff) is a situational decision that involves diminishing or losing one quality, quantity or property of a set or design in return for gains in other aspects.

2.5.4 Test and Implementation of 'To-Be' (Implementation of Reengineered Process)

- Implementation stage is the most challenging phase where reengineering efforts meet the most resistance. In this stage requirements for the construction of the "To-Be" components can be added and the result organized into a Work Breakdown Structure (WBS).
- The causal and sequential relationships between various activities planned can be defined. Using techniques like prototyping, simulation, the transition plan is validated.

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- After the validation process, its pilot versions are designed and demonstrated for implementation.
- Training programs for the workers are designed after the training program plan is executed in full scale.

2.5.5 Monitoring and Improving the Process Continuously

- Reengineering of processes cannot be done overnight.
- Every reengineering effort lies in redefining and improving the reengineered process continuously which is a vital part of BPR.
- Two things need to be monitored; first is the progress of action and second is the result.
- The progress of action taken is measured by watching how much more commitment the management shows; how much more informed the people feel are, and how well the change teams are accepted in the broader perspective of the organization.
- For monitoring the results, the monitoring should include the measures such as customer perceptions, employee attitudes, supplier responsiveness, etc.

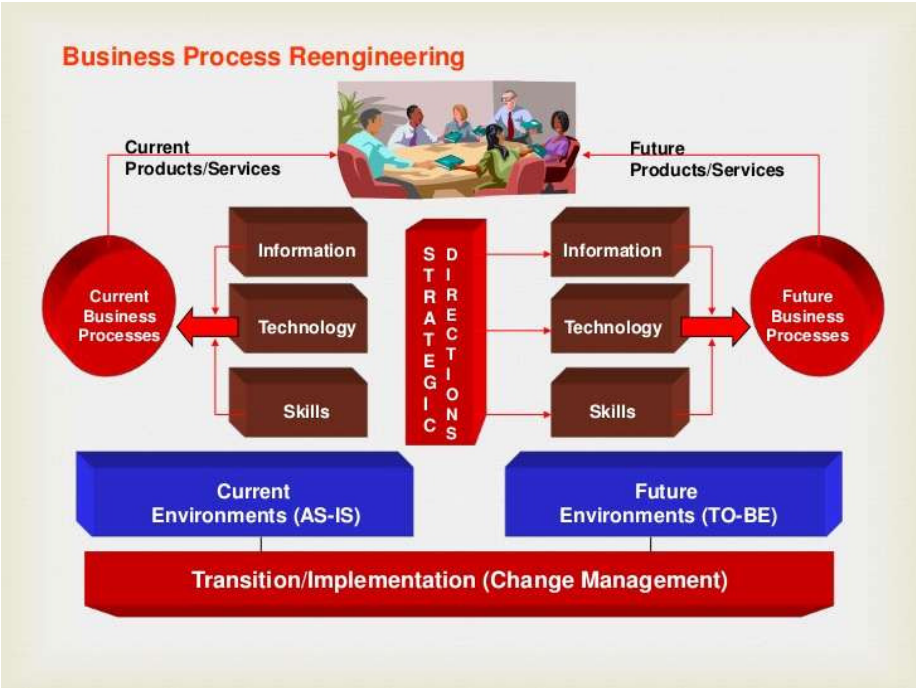


Fig. 2.14 *BPR's Change Management*

2.6 BUSINESS PROCESS INTEROPERABILITY (BPI)

In past few years, inter-organizational assistance has been one of the crucial organizational strategies. This strategy is mostly used to compete in the global market. In this context, internal business processes of an organization should interact to achieve common objectives that will be profitable for all parts of the organization.

Check Your Progress

11. Differentiate between 'As-Is' and 'To-Be' processes.
12. What things are needed to be monitored in the process continuously?

Hence, it is necessary to measure the degree of performance of these business processes under a strategic approach — from a global perspective (inter-enterprise) and from an individual or partial perspective (intra-enterprise).

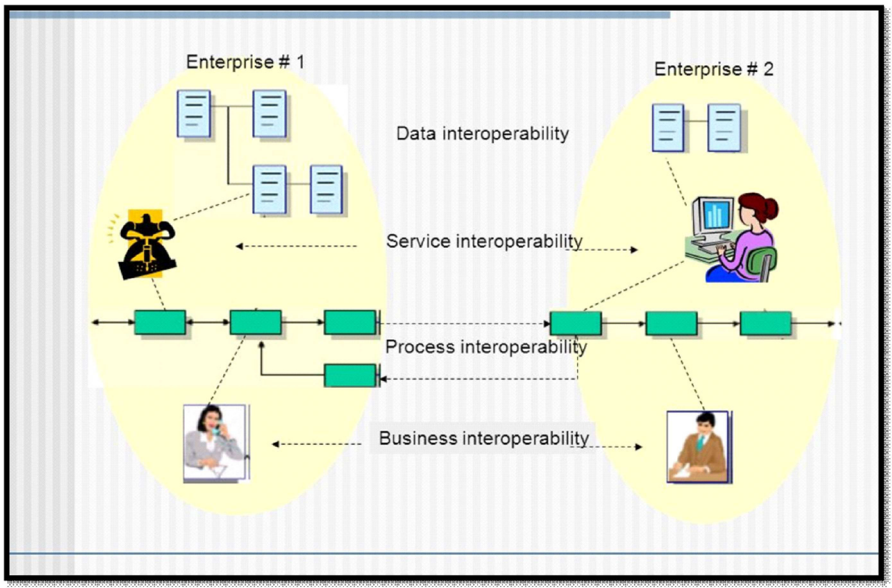


Fig. 2.15 Business Process Interoperability (BPI)

BPI is an ability of diverse agencies to be able to share jobs or tasks amongst themselves in order to deliver best service. As described above, Business Process Interoperability (BPI) is the ability of diverse business processes to work collectively, so called "inter-operate". This can be feasible when diverse business processes could meet specific business objective with automation and utilize only an essential human labor.

As shown in figure Business Process Interoperability is feasible only when a process conforms to standards and allows it to attain its objective, irrespective of location, ownership, version or design of the computer systems software used.

A "service-oriented architecture"(SOA) approach is used by BPI which emphasized on the processes instead of the technologies required to automate them.

An extensively used SOA is an effective way to address the problems initiated by different system.

2.6.1 Benefits of Interoperability

- Business process **interoperability** is an essential while achieving operational efficiency in any organization.
- Business units may have to perform redundant tasks without interoperability.
- This will result in different types of waste like a waste of time, manpower and resources, which could be utilized more efficiently in the business process.
- Interpolation is allowing diverse units to share the workload in the business process.
- Hence, it allows each unit to perform more efficiently at overall reduced cost to the organization.

NOTES

Interoperability: The ability of computer systems or software to exchange and make use of information.

Check Your Progress

13. What do you mean by Business Process Interoperability (BPI)?
14. List the benefits of BPI.

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2.7 BUSINESS PROCESS IMPROVEMENT

It is a strategic planning technique which is intended at identifying the operations or employee skills that can be enhanced. Those improved operations or employee skills encourage efficient workflow, smoother procedures, and overall business growth. This process is also called as 'functional process improvement'.

2.7.1 Objectives of Business Process Improvement

- The objective of business process improvement is to cater target customer demands and achieve business goals more effectively.
- Business Process Improvement seeks to get radical change in an organization's performance, instead of drawing out change management in incremental steps.
- Business process improvement addresses the system deficiencies or root causes of process. It harmonizes between IT and business goals.
- Process mapping is a tool which assesses business operations to address problem areas and adjust workflow; it is often the first step in a larger business process improvement endeavor.

2.8 BUSINESS PROCESS MAPPING

Business Process Mapping (BPM) is a sequence of phases or steps that take place in the business to convert inputs into outputs. BPM is the symbolic display of the steps or actions involved in a business process from start to finish. Six Sigma process mapping, value stream mapping, and process flow optimization — these are few terms used for process flow mapping. If used correctly, process flow mapping can become a powerful tool in kaizen technique for continuous improvement. This allows business to improve the value offered to their customers. Following figure shows symbols used in process mapping.

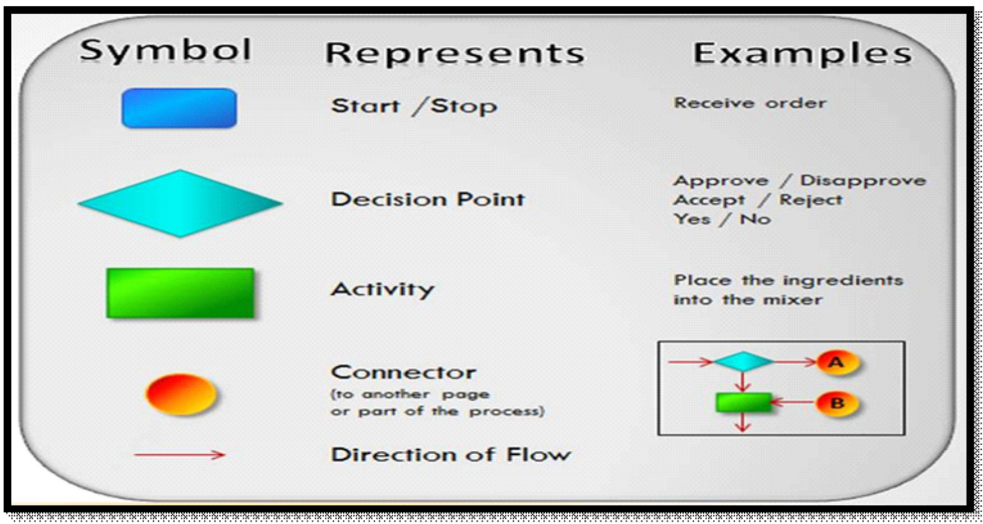


Fig. 2.16 Symbols in Process Mapping

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2.8.1 Salient Features of Process Mapping

These are as follows:

- Process mapping shows a brief picture of the series of tasks required to bring a product or service from beginning to accomplishment.
- Process mapping is often described as a flowchart and it usually proceeds either from left to right, or sometimes from top to down.
- It is part of workflow management practices; this includes business process modeling that can provide a more detailed representation of a process that generally incorporates additional organizational material.
- An organization should begin its business process mapping by recognizing the process need to be documented and identify the start and end points of the process.
- Organization should indicate decision points in the process as part of the documentation; these are points where a yes or no answer is required. Each answer leads the decision making process in either one of two directions.
- Organizational leaders should see the process or collect data from workers to create an accurate understanding of what tasks are involved in the process and in which sequence it happens.

An example of process mapping is shown below in diagram.

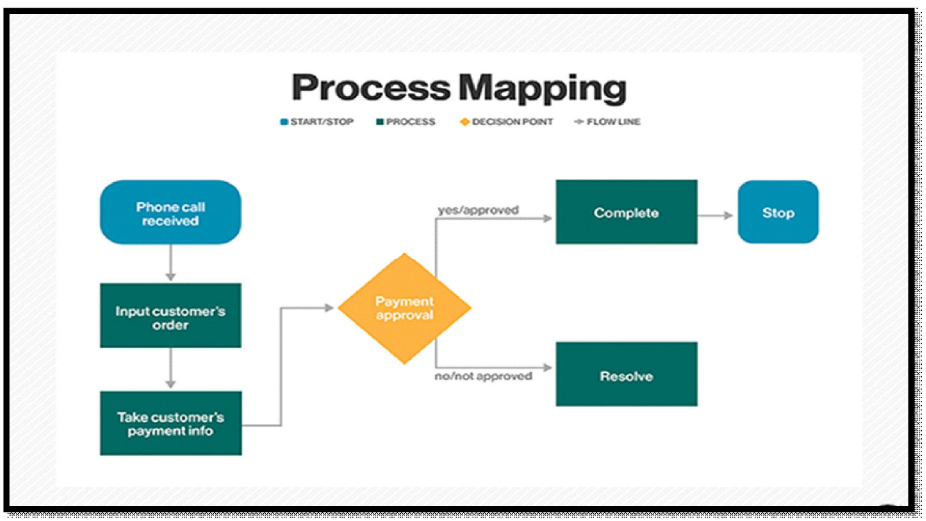


***Fig. 2.17** Process Mapping Stages*

2.9 BUSINESS PROCESS REENGINEERING AND PARTICIPANTS

The elements of an effective BPR team are summarized as follows:

- Ability of the members of the team, their motivation (Rastogi, 1994)
- Their credibility within the organization and their creativity (Barrett, 1994)

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- Team empowerment, training of members in process mapping and brainstorming techniques (Carr, 1993)
- Effective team leadership (Berrington & Oblich, 1995)
- Proper organization of the team (Guha, et al., 1993)
- Complementary skills among team members, adequate size, interchangeable accountability, clarity of work approach, and specificity of goals (Katzenbach & Smith, 1993).

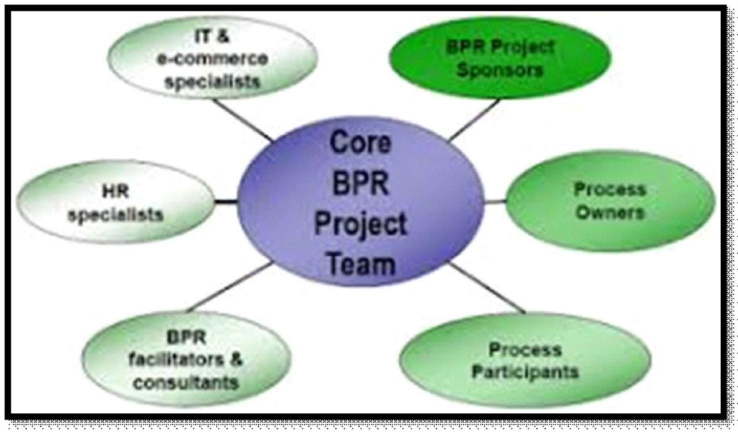


Fig. 2.18 *BPR Team*

Once organization wide commitment has been secured from all departments then the critical step is selecting a BPR team. BPR participant team will form the nucleus of the BPR effort, make key decisions and recommendations, and help communicate the details and benefits of the BPR program to the entire organization. The most effective BPR teams include active representatives from the following work groups: top management, business area responsible for the process being addressed, technology groups, finance, and members of all ultimate process users' groups.

For example, it may include members with the following characteristics:

- Members who do not know the process at all.
- Members who know the process inside-out.
- Customers, if possible.
- Members representing impacted departments.
- One or two members of the best, brightest, passionate, and committed technology experts.
- Members from outside of the organization (Dooley & Johnson, 2001).

Check Your Progress

15. What is Business Process Mapping?
16. List some of the characteristics of members of the BPR participant team.

2.10 SUMMARY

- A business process is a group of logically related tasks or group of activities that use the firm's resources to create value to a customer in support of the organization's objectives.
- Organizations have been grappling with complex work processes that impact productivity, one way or the other. Re-engineering the work processes has made a significant contribution to productivity.

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- It is pre-requisite on the part of the human resources manager to understand what creates complexity for most employees and tailor work accordingly, discarding whatever that does not add value and channeling work to employees who can handle the intricacies effectively.
- Making the workforce understand and comply with the simplified processes aids in the smooth functioning of the system as they remove unnecessary layers and controls. Innovative processes that bridge time and enhance productivity should be the focal point. Companies use different processes for reengineering across its functional departments.
- Redesigning focuses on the organizational structure which is designed in such way that it best supports redesigned business processes. It also focuses on rethinking, eliminating unnecessary work and finding more efficient ways of working.
- After implementation of BPR, instead of making minor changes to the business processes, Ford has decided to implement BPR and Information Technology (IT) to radically change its process of accounts payable. To start with, it has implemented an invoice-less process.
- The structural elements which constitute a process provide a basis for its analysis, appraisal and redesign. This could lead to achieving higher levels of efficiency, economy, effectiveness, output, speed and quality.
- Companies use different processes for reengineering across its functional departments. Manufacturing company could have the processes like cycle times, supply chain management, inventory control, quality improvement, defect minimization, etc.
- Information Technology plays a very crucial role in business process reengineering. It is an essential enabler in re-engineering efforts. It is a major enabler for new ways of working.
- Innovative use of technology allows design engineers to design at computer workstations instead of at drafting design on papers. Working at computer screen instead of on drawing paper would have made the design engineers individually more productive.
- Before attempting reengineering process, necessity for reengineering should be identified. Once significant need is identified, a cross-functional team is recognized and appropriate plan for the process of reengineering is established. It is also important to find the gap between the expectations of the customer and existing business processes.
- In past few years, inter-organizsational assistance has been one of the crucial organizsational strategies. This strategy is mostly used to compete in the global market. In this context, internal business processes of an organization should interact to achieve common objectives that will be profitable for all parts of the organizsation.

NOTES

2.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Sometimes radical redesigning and reorganizing an enterprise becomes necessary to lower costs, increase productivity and improve the quality of service. Organizations have been grappling with complex work processes that impact productivity, one way or the other. Re-engineering the work processes has made a significant contribution to productivity.
2. Process improvement comes from analyzing and re-engineering work processes to eliminate unnecessary steps and save time that instead could be used for other productive purposes. Making the workforce understand and comply with the simplified processes aids in the smooth functioning of the system as they remove unnecessary layers and controls.
3. Redesigning focuses on the organizational structure which is designed in such way that it best supports redesigned business processes. It also focuses on rethinking, eliminating unnecessary work and finding more efficient ways of working. There are numerous businesses which have successfully implemented BPR.
4. These major steps managers should appraise for the BPR implementation. These are as follows:
   - Refocus company values on customer satisfaction
   - Redesign core business processes, using information technology to enable improvements in the processes
   - Reorganize a business into cross-functional teams and define end-to-end responsibility for each process
   - Rethink about basic organizational and employee challenges
   - Improvement in business processes across the organization
5. Some of the processes of reengineering are:
   - Reduction in cost and cycle times: Reengineering methodology reduces different costs. It also reduces cycle times by eradicating unproductive activities performed by the employees during the operation. Reorganization of teams decreases the need for management layers, accelerates information flows and eliminates the errors, rework caused by multiple handoffs.
   - Quality Improvement: Quality is very significant aspect in every organizational process and for final product and services. Reengineering processes enhance the quality in work by reducing the fragmentation of work. Clear ownership of processes is created. Hence workers are responsible for their output and they can measure their performance based on prompt feedback.
6. Information Technology has a very positive impact on individual, functional unit and organization. Several examples can be cited to prove that IT is an enabler in BPR.
7. Information Technology has come a long way to its current shape where it is playing a very dominant role in our every sphere of life.Organizations use IT systems to perform various tasks. Some use IT to provide for the basic processing of transactions, while others enable customers, distributors and suppliers to interact with the organization through various communication technology systems.

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8. New process implemented by Kodak is called concurrent engineering. It has been used widely in the automotive industries and aerospace. Also, it is now starting to attract adherents in consumer goods companies.
9. Ford, IBM and Kodak are some of the companies that depict requisite characteristics of reengineering efforts. They also fulfill the definition of reengineering that is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as quality, service, and speed, and cost.
10. Stages of BPR methodologies are;
    - Evaluation
    - Reconstruction
    - Redesign
    - Envision
    - Initiation
    - Diagnosis
11. 'As-Is' or 'Current State' is to understand how things are done currently. Reengineering team should understand the existing process before they advance to redesign the process. In "To-Be" process, more alternatives are produced to the current situation or current process in order to achieve goals of an organization.
12. Two things need to be monitored; first is the progress of action and second is the result.
13. Business Process Interoperability (BPI) is the ability of diverse business processes to work collectively, so called "inter-operate". This can be feasible when diverse business processes could meet specific business objective with automation and utilize only an essential human labor.
14. Following are the benefits of Business Process Interoperability:
    - Business process interoperability is an essential while achieving operational efficiency in any organization.
    - Business units may have to perform redundant tasks without interoperability.
    - This will result in different types of waste like a waste of time, manpower and resources, which could be utilized more efficiently in the business process.
    - Interpolation is allowing diverse units to share the workload in the business process.
    - it allows each unit to perform more efficiently at overall reduced cost to the organization.
15. Business process mapping is a sequence of phases or steps that take place in the business to convert inputs into outputs. It is the symbolic display of the steps or actions involved in a business process from start to finish.
16. Members should have the following characteristics:
    - Members who do not know the process at all
    - Members who know the process inside-out
    - Customers, if possible

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- Members representing impacted departments.
- One or two members of the best, brightest, passionate, and committed technology experts
- Members from outside of the organization

2.12 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate in brief the significance of reengineering in company's growth.
2. Write a brief note on Ford's Accounts Payable Process as an example about BPR implementation.
3. State the various ways in which reengineering process helps the company achieve its long-term goal.
4. How does quality improvement play a key role in organizational process?
5. Write a short note on the role of Information Technology in the BPR.
6. Enumerate in brief about the BPR stages.
7. State the main objectives of Business Process Improvement.

Long-Answer Questions

1. Discuss how reengineering the work process enhances the company's productivity.
2. Enumerate how Ford's BPR implementation helped it in streamlining its workforce.
3. Elaborate the appraisal processes for BPR implementation.
4. Taking Kodak case as a reference, describe how Information Technology is an enabler in the BPR.
5. Analyze 'To-Be' process and its implementation for a successful BPR effort.
6. Discuss business process interoperability (BPI) and its benefits in the organization.
7. Explain Business Process Mapping (BPM) and its various features for the BPR implementation.

UNIT 3 IMPLEMENTING BUSINESS PROCESS REENGINEERING (BPR)

NOTES

Structure

3.0 Introduction
3.1 Unit Objectives
3.2 Implementing BPR: An Overview
  3.2.1 Relation between BPR and Information Technology
  3.2.2 Effectiveness of Reengineering
  3.2.3 Approval of BPR
  3.2.4 Preparations for Implementation
  3.2.5 BPR Process Chart
3.3 Understanding Change Management
  3.3.1 Seven-step Approach to Manage Change
3.4 Communication and its Role in Reengineering
  3.4.1 Aspects of Effective Communication
3.5 Commitment, Control and Contours
  3.5.1 Commitment
  3.5.2 Checking, Control and Contours
3.6 Reengineering Reporting and Systems Thinking
  3.6.1 Reengineering Reporting
  3.6.2 Systems Thinking
3.7 Reengineering Enabling Processes
  3.7.1 Continous Improvement
3.8 Bottom-up Participation Process
  3.8.1 The Arrangement of Employee Participation through BPR
3.9 BPR Principles
3.10 Summary
3.11 Answers to 'Check Your Progress'
3.12 Questions and Exercises

3.0 INTRODUCTION

Many organizations have reported dramatic benefits gained from the successful implementation of Business Process Reengineering (BPR). Companies like Ford are all recognized as having successfully implemented BPR. However, despite the significant growth of the BPR concept, not all organizations embarking on BPR projects achieve their intended result. BPR has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction, but it often requires a fundamental organizational change. As a result, the implementation process is complex, and needs to be checked against several factors to ensure successful implementation, as well as to avoid implementation pitfalls. There are various dimensions of change like change management, management competency and support, effective communication, reengineering enabling processes, continuous improvement, IT infrastructure and others for the implementation of BPR.

Change management, which involves all human and social-related changes and cultural adjustment techniques needed by management, is considered by many to be a crucial component of BPR efforts. Staff motivation through a reward programme has a crucial role in facilitating reengineering efforts and smoothing the insertion of new processes in the workplace. Effective communication is considered a major key to successful BPR-related change efforts. Communication between stakeholders inside and outside the organization is necessary to market a BPR programme. As BPR results in decisions being pushed down to lower levels, empowerment of both individuals and teams becomes a critical factor for successful BPR efforts. As the success of BPR projects varies significantly, it remains a challenge to systematically discover weaknesses in business process landscapes.

This unit seeks to analyze various dimensions for a smooth and hassle-free transformation for the implementation of BPR in an organization.

3.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Understand the implementation of BPR
- Discuss the approval process of BPR
- Analyze the preparations for BPR implementation
- Explain the role of BPR process chart
- Understand the role of change management and communication
- Analyze reengineering reporting and system thinking
- Understand the reengineering-enabled processes
- Explain the continuous movement in the BPR
- Understand the participation process and BPR principles

3.2 IMPLEMENTING BPR: AN OVERVIEW

Business Process Reengineering (BPR) has been an enormous success in every business organization. It is getting underway in various industries like banking, automobile, electronics, etc. Moreover, new technology is generating pool of opportunities for an entirely new wave of reengineering efforts in the various industries.

3.2.1 Relation between BPR and Information Technology

During 1990s, reengineering was first implemented in the warehouse, in the back office, and the factory. For the new 21st century, BPR has been applied to the front office and the revenue- generating side of the business such as product development, sales, and marketing. Since its inception, reengineering has a close relationship with Information Technology (IT).

Advance technology enables the processes. These processes are the essence of reengineering to be redesigned. Reengineering and Information Technology have a

symbiotic relationship in a way that, without information technology, only little reengineering can be done and without reengineering, information technology delivers little payoff.

Enterprise Resource Planning (ERP) has been the most important reengineering-related technology in last five years. ERP has a lot of significance in BPR implementation process. It is an integrated software system which supports individual functional areas as well as complete business processes.

Businesses, which made an attempt to implement an ERP system without reengineering in their operational and non-operational processes, were disappointed by the uncertain payoffs which they have received (outside the narrow domain of improved information technology operations and cost).

On the contrary, the business, which is reengineering, is closely linked with an information technology that could initiate it to integrate corporate functions as well as entire corporations.

3.2.2 Effectiveness of Reengineering

The crucial role of reengineering process can be understood by numerous findings which are given below:

- The genesis of reengineering appears in a phrase from one of the authors who coined in the late 1980s: 'Automating a mess yields an automated mess.' Unless the company re-conceptualized its operations and overlaying, updated technology on these operations accomplished insignificant results.
- In today's era, above slogan has been updated: 'Putting a Web site in front of lousy business processes merely advertises how lousy they are.' In the absence of robust, reengineered processes, electronic commerce would be challenging.
- For handling and filling orders, non-reengineered processes are so complex and unreliable that they can hardly be performed by skilled experts.
- Companies involved in online selling demand a fresh round of reengineering. For example, in the mid-1990s, IBM reengineered most of its processes, but has just boarded on it again, this time to "Web-enable" these processes for electronic commerce.
- The most popular *'Business Week'* acknowledged the relationship between the reengineering and Internet in its first special report on electronic business. It called the implementation of e-commerce as 'e-engineering.'
- The new trend of Internet-enabled business demands new ways of working and reengineering is the tool that can create them.
- The first-wave reengineering dissolved functional boundaries in order to concentrate on the end-to-end business processes, which create real customer value and surpass these boundaries.
- Gradually, more companies started accelerating their reengineering to rethink and reinvent how they would work with their valued customers and raw material suppliers.

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3.2.3 Approval of BPR

- A framework is developed which can be followed by any process analyst to perform BPR. This framework initiates a new process reengineering project and prepares a business case for the same. An approval from senior manager and top management is necessary to start the process reengineering project.
- Before implementation of BPR, different flow chart related to reengineering process is developed and approval of the same is taken before process redesigns.
- Business Process Reengineering is a management approach which intended towards improvements. In this regard, proposed changes are represented through the flowchart and approval for the same is obtained from the management regarding proposed changes.
- On approval and acceptance of these proposed changes, the BPR Team starts implementing the reengineering process.

3.2.4 Preparations for Implementation

It has been well said that, 'If you fail to plan, you plan to fail.' Hence it is significant to understand the need for process improvement or implement any change in the business activity.

To become successful in business endeavors, planning and preparations are essential factors for any business activity or event. In preparations of BPR, the main emphasis should be given on human resource management, followed by their training and development and then building a cross functional team becomes a crucial decision.

Any BPR activity needs to start with a clearly defined customer driven objectives which should be measurable. Objective could be reducing costs, increasing efficiency, improving quality of product or service. The framework for what needs to be accomplished has to be finalized upon at the outset, and it should be in line with the company's vision and mission. Based on the vision and mission, strategic purpose is identified.

3.2.5 BPR Process Chart

Starting with fresh ideas, BPR cross functional team should work on designing a process chart for the new process. While developing a process chart, each section of the process must be checked with team members who are working directly on the process.

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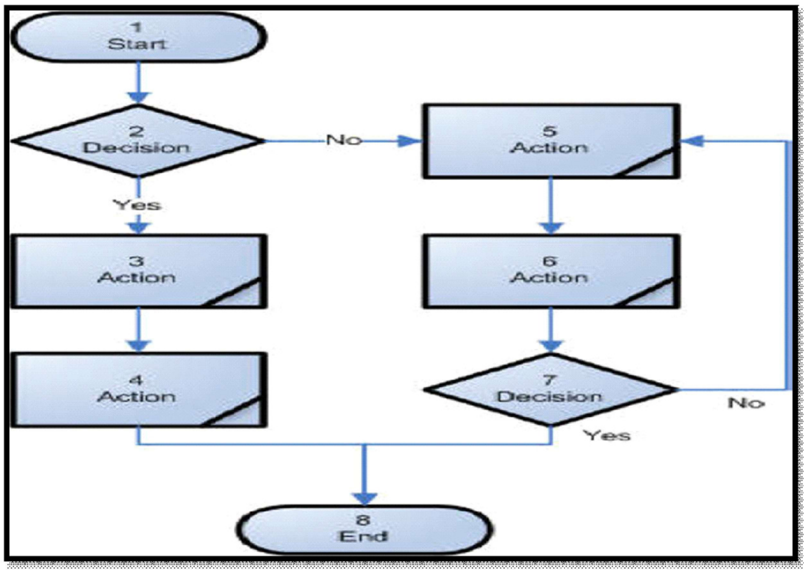
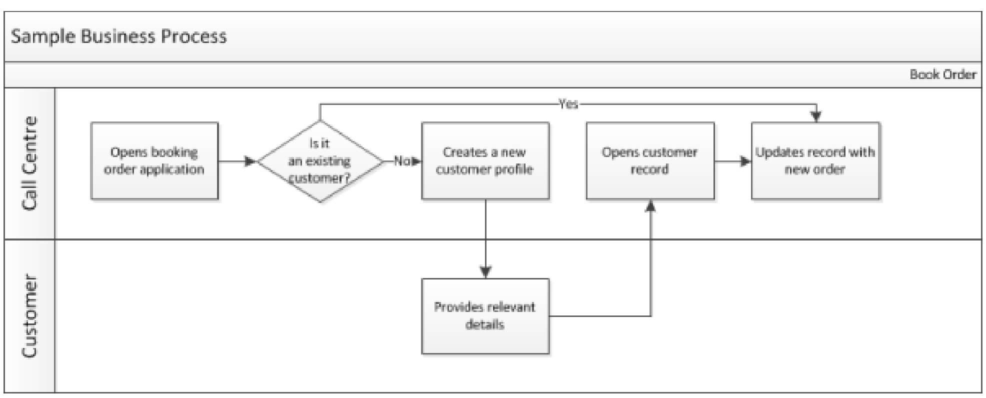


Fig. 3.1 Symbols Used to Draw the Process Chart

Salient Features of Process Chart

- Process chart is conducive for communication among the team and offers references for process reengineering.
- By developing clear charts and tables, it presents a clear understanding of a project.
- Process chart assists to see whether there are lapses that may be hindering the productivity.
- There are certain software available like 'Edraw a BPR software' which provides effective templates for reengineering processes and with these templates, team member can use them to build a model.
- The pathway leads through clear display of the defined goals, flowcharting of a new process, trials for selected processes, data collections, interpretation and analysis.
- Based on analysis, consensual decisions are taken and finally, it leads to the standardization on a new process.

Below is an example shown of sample business process flow chart.



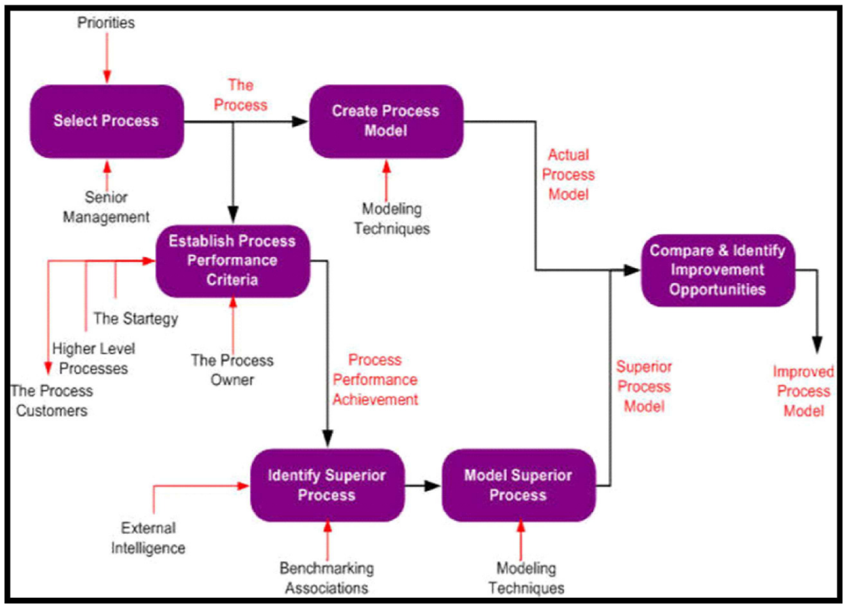


Fig. 3.2 *Sample of the Business Process Chart*

3.3 UNDERSTANDING CHANGE MANAGEMENT

The rapid transmission of information technology into commercial arena has given rise to many organizational changes. The firms have to redefine and restructure their business strategies to cope up with these rapid changes. Business Process Reengineering (BPR) is a modern technique available for managing the changes.

Change Management process refers to the implementation, control and guidelines to introduce change into organizations.

Changing business processes, dynamic organizational structure and operating procedures are interrelated to each other and based on the magnitude of the change can be met with employee resistance. However, change is a continuous learning process and its impact can be minimized if change is managed properly.

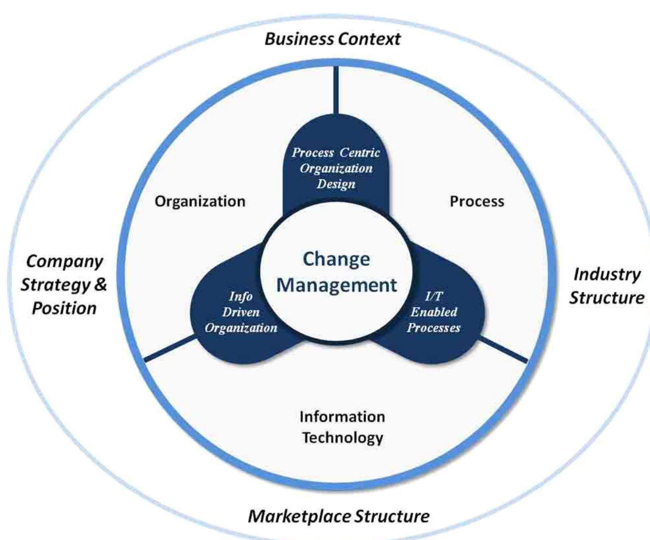


Fig. 3.3 *Change Management*

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Change management: Change management is a collective term for all approaches to preparing and supporting individuals, teams, and organizations in making organizational change.

Check Your Progress

1. State the rationale behind implementing BPR.
2. What are the dimensions of changes for the implementation of BPR?
3. What is the relation between Information Technology and reengineering?
4. What do you mean by Enterprise Resource Planning (ERP)?
5. List some of the crucial roles of reengineering process.
6. What role does process chart play in the new process?

3.3.1 Seven-step Approach to Manage Change

A business organization contemplating the introduction of business process reengineering should follow a seven-step approach to manage change. These are as follows:

NOTES

1. First step is assembling a changed management team

The head of a strategic business unit (SBU) or the chief operating officer (COO) heads the BPR team and as a leader he initiate major changes in the business processes of the organization. However, BPR team has other commitments; it is always better to form a small team which is responsible for change management. This team will also assist the team leader in reengineering efforts. In an organization, major change initiatives come from catalysts (those who are in middle or junior management level) rather than a top management. The team which manages change is referred to as "transition management team".

2. Establishing a new direction for the organization

The mission statement provides a new direction to the organization. An organization in which reengineering process is introduced, the mission statement of an organization should reflect the organization's commitment to team work and process-orientation.

3. Preparing the organization for change

The appropriate message of change should be communicated to the employees at all levels of the organization. The emphasis of communication should be on inevitability and the urgency of change and also the benefits of change.

4. Setting up change teams to implement change

BPR team leader forms the change teams which are referred as reengineering teams. Each change team is headed by a "process owner". Process owner is responsible for implementing a reengineered business process.

As reengineered processes are cross-functional in nature, each reengineering team represents members from different departments. The team members in a change team should be expert in their domain, enthusiastic and creative. Team members should be also able to handle employee resistance during the implementation of reengineered processes.

5. Aligning structures, resources and systems to support change

Current organizational structure, procedures and systems should be observed and analyzed by change management team to ensure that these all are aligned properly with the change process. Reengineering teams should assist the change management teams in above-mentioned tasks. In BPR, the emphasis is mainly on process orientation.

As a result, the organization structure becomes flat (less number of hierarchical levels). The team members in change management must be empowered to take decisions and they should be given autonomy to work independently. The change management team members should support the reengineering team to put their new ideas related to process into practice.

6. Identifying and eradicating road blocks to change

As discussed above, reengineering comprehends major charges and resistance to such changes is unavoidable. As per the recommendation of reengineering teams, many drastic changes may need to be incorporated in existing systems. There could be a possibility that resistance may occur to change which may create a road block to recommendations given by reengineering team. Hence, change management team should support to remove these road blocks.

Resistance to change and reengineering may be expressed either overtly or covertly by executives at any level of management. It is essential that top management acts as role models to implement change and motivate others to follow the same.

7. Absorbing changes into the culture of the organization

As a part of reengineering process, change should be internalized and institutionalized. Change initialization process will lead to employees identifying themselves with process instead of functions or departments. They will be responsible for the complete process rather than a specific discrete functions or part of job which they perform during the process. It results into radical changes in the performance appraisal as well as reward systems. The new radical system must emphasis on team work, process-orientation and most important customer satisfaction.

3.4 COMMUNICATION AND ITS ROLE IN REENGINEERING

Communication plays a very significant role in a business organization .Communication acts as a source of information in reengineering process. It plays a vital role in the decision-making process. Change management team members should communicate one on one to small groups of front-line supervisors regarding the aim of introducing major changes. Change management team members also encourage employees to raise their concerns without any hesitation and team members should clear their doubts regarding the changes.

Reengineering team should also emphasize more on one to one communication and front-line supervisors act as a focal link in the communication chain.

3.4.1 Aspects of Effective Communication

Three important aspects of effective communication in reengineering are:

- Communicate to the concern members only about facts and not values
- Perform direct communication (i.e., face to face)
- While communicating, target to the front-line supervisors who take dynamic part in introducing change.

3.5 COMMITMENT, CONTROL AND CONTOURS

Let us understand the essentials of commitment, control and contours.

3.5.1 Commitment

While implementing any decision in the organization, commitment along with the communication towards the decision made is essential.

- To begin with top management, Sr. manager, manager, supervisors and worker on the shop floor, and every individual in an organization should have commitment over these reengineering efforts.
- Dedicated time and resources should be committed towards reengineering efforts.
- For successful implementation, organization-wide commitment should be taken from all departments involved in the reengineering effort.

3.5.2 Checking, Control and Contours

These should be done in the following ways:

- During business operations, there could be certain non-value-adding work that gets reduced in reengineered processes during checking and control.
- Reengineered processes use controls only to the degree at which it makes economic sense.
- With checking and control steps, conventional processes could complete which do not add any value. However, they are included to ensure that team members are not harming the process.
- For example, in a typical procurement process, the purchasing department verifies the signature of the person demanding an item to make sure that person is authorized to obtain the requisitioned goods in the amount specified. Also, it is necessary to confirm that the department's budget is appropriate for the bill.
- In some instances, cost of the checking and control may even exceed the cost of the goods being purchased.
- In these kinds of situations, reengineered processes show a more balanced approach. Rather than tightly checking work as it is performed, reengineered processes commonly have cumulative or deferred controls.
- The reengineered contour and control systems place certain outline by lowering the costs and other hindrances associated with the control itself.

3.6 REENGINEERING REPORTING AND SYSTEMS THINKING

Let us understand the process of reengineering reporting and systems thinking.

NOTES

Check Your Progress

7. What do you understand by change management?
8. What are the seven-step approaches to manage change?
9. State the role of communication in reengineering process.
10. Enumerate the role of checking, control and contours in reengineering.

NOTES

3.6.1 Reengineering Reporting

In reengineering, process management creates a rule for every contingency which they could imagine, and lines of authority and reporting were clearly drawn. Other important points to be noted are:

- Reengineering provides profitability from reporting and analysis from different perceptive like organization, customer, segment a product, channel.
- Reengineering reporting generates business planning and forecasting reports which include performance measurement systems meet risk management goals.
- Reengineering reporting highlights best practice management discussion and analysis disclosures (MD&A).

The railroad companies literally programmed their workers to act only in accordance with the rules, which was the only way management knew to make their one-track systems predictable, workable, and safe. Programming people had to conform to established procedures which remains the essence of bureaucracy even now. The command-and-control systems in place in most companies today embody the same principles the railroads introduced 150 years ago. The next large evolutionary steps in the development is Management Reporting.

Systems thinking: It often involves moving from observing events or data, to identifying patterns of behaviour overtime, to surfacing the underlying structures that drive those events and patterns.

3.6.2 Systems Thinking

- **System thinking** is a management discipline that deals with the understanding of a system by scrutinizing the relations and interactions between the components that comprise the entirety of that defined system of reengineering.
- The complete system is a systems thinking's view of an entire organization in relation to its external and internal environment.
- It facilitates a means of understanding, evaluating about the design and construction of the organization as an integrated, complex composition of many interconnected systems (human and non-human) which need to work together for to function effectively.
- Whole systems consisting of systems including the basic unit, which includes several entities like people, policies, processes and practices. This may be broken down further into sub-systems.
- A complete system can succeed only through different department managers collaborating in and across a number of functional systems.

In reengineering process, systems thinking is concerned with understanding the problematic situations, based on the concepts and principles of the systems paradigm. Systems thinking considers the similarities between systems from different areas in terms of a set of common systems, principles, concepts and patterns:

- A principle is a rule of behavior or conduct .To discuss further, a principle is a "basic generalization that is accepted as true and that can be used as a basis for reasoning or conduct"
- A concept is a general idea or an abstraction, inferred or derived from specific instances.
- In short, systems thinking is an approach or discipline which supports business process reengineering

3.7 REENGINEERING ENABLING PROCESSES

NOTES

In BPR, companies begin with a blank piece of paper and rethink existing processes to deliver superior customer value. They normally implement a new value system that gives an emphasis on customer needs. As discussed above, BPR is a dramatic change initiative in business processes. In reengineering enabling, processes, company refocuses values on customer needs.

- Company redesigns its core processes related to operations, marketing, distribution and logistics.
- To enable improvements often redesign of these core processes is done using information technology
- Business is reorganized into a cross-functional teams with end-to-end responsibility is given according to the process.

3.7.1 Continous Improvement

For a longer time, there has been lot of debate on relationship between continuous process improvement and business process reengineering. While each aims for process improvement, these two approaches are very similar. The difference between two approaches is in focus.

Aspects of Continuous Improvement

These are as follows:

- Organizations have various processes and systems which perform the work of the system.
- The relations among the parts describe how the work should be performed.
- Let us understand the same with an example: a business process has different department employees as its parts, and procedures and directives as its relations.
- To succeed in meeting its objectives, both parts and relations must be effective for the system. As discussed above, BPR is the "fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measure of performance, such as cost, quality, service and speed," according to Hammer and Champy in *Reengineering the Corporation*, the book they authored.
- To accomplish the drastic improvements, a focus on relations is essential, since, systems theory defines that relations primarily determine system performance.
- Therefore, business process reengineering focuses on system relations. On the contrary, continuous process improvement looks for incremental improvements which are not drastic.
- Following figures give clear similarities and differences in both the approaches.

NOTES

Reengineering & Continuous Improvement--*Similarities*

	Reengineering	Continuous Improvement
Similarities		
Basis of analysis	Process	Process
Performance measurement	Rigorous	Rigorous
Organizational change	Significant	Significant
Behavioral change	Significant	Significant
Time investment	Substantial	Substantial

As shown in figure above, continuous process improvement and business process reengineering have the similarities on basis of analysis, performance measurement, organizational change, behavioral change and time investment.

As shown in figure below, continuous process improvement and business process reengineering have the similarities on basis of level of change, starting point, participation, risk, primary enabler and type of change.

Reengineering & Continuous Improvement--*Differences*

	Reengineering	Continuous Improvement
Differences		
Level of change	Radical	Incremental
Starting point	Clean slate	Existing process
Participation	Top-down	Bottom-up
Typical scope	Broad, cross-functional	Narrow, within functions
Risk	High	Moderate
Primary enabler	Information technology	Statistical control
Type of change	Cultural and structural	Cultural

3.8 BOTTOM-UP PARTICIPATION PROCESS

Apart from the similarities and differences in reengineering and continuous improvements, it is also essential to discuss about TQM and reengineering. Both these approaches focus on processes. However, TQM emphasizes more on continuous improvements and bottom-up participation of employees whereas reengineering process typically originates from the top-down broad cross functional processes across the department. BPR questions the logic of existing designs and usually, it is an effort to achieve quantitative improvement.

Check Your Progress

11. What do you understand by reengineering reporting and systems thinking?
12. On which bases one could find similarities between reengineering and continuous process?

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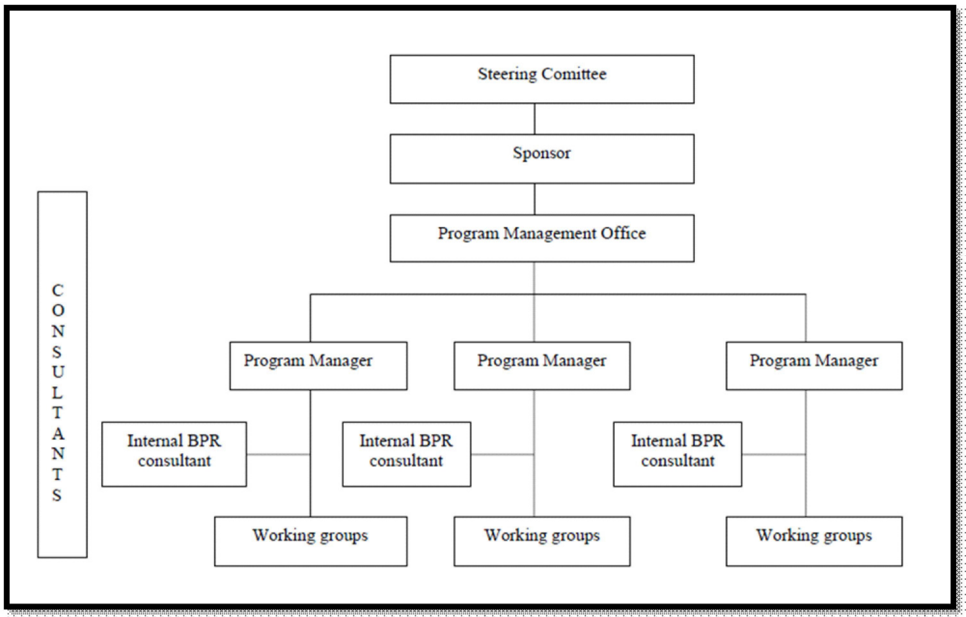


Fig. 3.4 *Employee Participation through BPR*

3.8.1 The Arrangement of Employee Participation through BPR

As displayed in the above figure, it comprises a setup where each plays its role. It contains the following:

1. **Steering committee**: Steering committee is made up of the president, the director-generals and the directors of the staff services.
2. **Sponsor**: President of programme who is the face of the whole process and also president can be seen as the 'engine' of the reform. The unconditional support of the president for the reengineering process is recognized as a critical factor of success.
3. **The programme management office**: Programme office consists of generals of directors of staff, communication services and consultants. Programme office is responsible for the daily management and the general coordination of the BPR and office members meet weekly.
4. **Programme managers**: They are responsible for the certain specified programmes. Managers do follow the programme from planning stage to implementation stage.
5. **Internal BPR consultants**: They are civil servants, designated by the president of their functional department who support and coordinate the reengineering.
6. **Working groups**: They have numerous roles to follow. These are:
   - Working groups are crucial in a bottom up participation process.
   - For each programme, number of working groups has been identified. Employee at a bottom level gets its chances to participate in the reform process during the reengineering of their organizations.

NOTES

- Working group employees are actively involved in the whole reengineering process.
- Hence, BPR process can be a true instrument of bottom-up participation.
- Communication towards the shop-floor should very clear and transparent hence bottom-up participation process would be more effective which will also result in successful implementation of reengineering process.

3.9 BPR PRINCIPLES

Hammer and Champy, in their book, also outlined seven reengineering principles to streamline the work process and thereby achieve significant levels of improvement in quality, time management and cost. These are as follows:

- Organize around outcomes, not tasks.
- Identify organization's processes and rank them in order of redesign urgency.
- Integrate information processing work into the real work that produces the information.
- During reengineering process treat geographically isolated resources as they were centralized.
- Link parallel activities during the workflow instead of integrating their final results.
- Put decision points where the work is performed and build controls into the process.
- Capture information once and at the source.

3.10 SUMMARY

- Many organizations have reported dramatic benefits gained from the successful implementation of Business Process Reengineering (BPR). Companies like Ford are all recognized as having successfully implemented BPR.
- There are various dimensions of change like change management, management competency and support, effective communication, reengineering enabling processes, continuous improvement, IT infrastructure and others for the implementation of BPR.
- Change management, which involves all human and social-related changes and cultural adjustment techniques needed by management, is considered by many to be a crucial component of any BPR efforts.
- As BPR results in decisions being pushed down to lower levels, empowerment of both individuals and teams becomes a critical factor for successful BPR efforts. As the success of BPR projects varies significantly and it remains a challenge to systematically discover weaknesses in business process landscapes.
- Reengineering and Information Technology have a symbiotic relationship in a way that, without information technology, only little reengineering can be done and without reengineering, information technology delivers little payoff.

Check Your Progress

13. Enumerate the bottom-up participation process.
14. List the roles played by working groups in reengineering process.
15. Who did outline the BPR principles? List some of them.

NOTES

- The first-wave reengineering dissolved functional boundaries in order to concentrate on the end-to-end business processes, which creates real customer value and surpass these boundaries.
- Any BPR activity needs to start with a clearly defined customer driven objectives which should be measurable. Objective could be reducing costs, increasing efficiency, improving quality of product or service.
- Changing business processes, dynamic organizational structure and operating procedures are interrelated to each other and based on the magnitude of the change can be met with employee resistance. However, change is a continuous learning process and its impact can be minimized if change is managed properly.
- Resistance to change and reengineering may be expressed either overtly or covertly by executives at any level of management. Hence, it is essential that top management acts as role models to implement change and motivate others to follow the same.
- Change management team members should communicate one on one to small groups of front-line supervisors regarding the aim of introducing major changes. Change management team members also encourage employees to raise their concerns without any hesitation and team members should clear their doubts regarding the changes.
- Continuous process improvement and business process reengineering have the similarities on basis of analysis, performance measurement, organizational change, behavioral change and time investment.
- Hammer and Champy, in their book, outlined seven reengineering principles to streamline the work process and thereby achieve significant levels of improvement in quality, time management and cost.

3.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. BPR has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction, but it often requires a fundamental organizational change. As a result, the implementation process is complex, and needs to be checked against several factors to ensure successful implementation, as well as to avoid implementation pitfalls.
2. There are various dimensions of change like change management, management competency and support, effective communication, reengineering enabling processes, continuous improvement, IT infrastructure and others for the implementation of BPR.
3. Advance technology enables the processes. These processes are the essence of reengineering to be redesigned. Reengineering and Information Technology have a symbiotic relationship in a way that, without information technology, only little reengineering can be done and without reengineering, information technology delivers little payoff.

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4. Enterprise Resource Planning (ERP) has been the most important reengineering-related technology in last five years. ERP has lot of significance in BPR implementation process. It is an integrated software system which supports individual functional areas as well as complete business processes.
5. In the absence of robust, reengineered processes, electronic commerce would be challenging. The relationship between the reengineering and Internet is widely acknowledged. The new trend of Internet-enabled business demands new ways of working and reengineering is the tool that can create them. The first-wave reengineering dissolved functional boundaries in order to concentrate on the end-to-end business processes, which creates real customer value and surpass these boundaries.
6. Starting with fresh ideas, BPR cross functional team should work on designing a process chart for the new process. While developing a process chart, each section of the process must be checked with team members who are working directly on the process.
7. Change management process refers to the implementation, control and guidelines to introduce change into organizations. Changing business processes, dynamic organizational structure and operating procedures are interrelated to each other and based on the magnitude of the change can be met with employee resistance. However, change is a continuous learning process and its impact can be minimized if change is managed properly.
8. The seven-step approaches to manage change are:
   - First step is assembling a changed management team.
   - Establishing a new direction for the organization.
   - Preparing the organization for change.
   - Setting up change teams to implement change.
   - Aligning structures, resources and systems to support change.
   - Identifying and eradicating road blocks to change.
   - Absorbing changes into the culture of the organization.
9. Communication plays a very significant role in a business organization Communication acts as a source of information in reengineering process. It plays a vital role in the decision- making process. Change management team members should communicate one on one to small groups of front-line supervisors regarding the aim of introducing major changes.
10. With checking and control steps, conventional processes could complete which do not add any value. However, they are included to ensure that team members are not harming the process. The reengineered contour and control systems place certain outline, by lowering the costs and other hindrances associated with the control itself.
11. Reengineering reporting highlights best practice management discussion and analysis disclosures (MD&A).System thinking is a management discipline that deals with the understanding of a system by scrutinizing the relations and interactions between the components that comprise the entirety of that defined system of reengineering.

12. Continuous process improvement and business process reengineering have the similarities on basis of analysis, performance measurement, organizational change, behavioral change and time investment.
13. It is also essential to discuss about TQM and reengineering. Both this approaches focus on processes. While TQM emphasizes more on continuous improvements and bottom-up participation of employees, reengineering process typically originates from the top-down broad cross functional processes across the department.
14. Working groups have numerous roles to follow. These are:
    - Working groups are crucial in a bottom up participation process.
    - For each programme, number of working groups has been identified. Employee at a bottom level gets its chances to participate in the reform process during the reengineering of their organizations.
    - Working group employees are actively involved in the whole reengineering process.
15. Hammer and Champy, in their book, outlined seven reengineering principles to streamline the work process and thereby achieve significant levels of improvement in quality, time management and cost. Some of these principles are as follows:
    - Organize around outcomes, not tasks.
    - Identify organization's processes and rank them in order of redesign urgency.
    - Integrate information processing work into the real work that produces the information.
    - Link parallel activities during the workflow instead of integrating their final results.
    - Capture information once and at the source.

3.12 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate in brief the significance of implementing BPR.
2. Write a brief note about the relation between BPR and Information Technology (IT).
3. State the need of a framework for approvals of BPR.
4. Enumerate some features of BPR process chart.
5. Write a short note on the effectiveness of communication in reengineering.
6. Enumerate the role of commitment in BPR.
7. What are the main objectives of bottom-up participation process?

Long-Answer Questions

1. Discuss how IT-enabled reengineering process has impacted the business of a company.
2. Enumerate the role of planning and preparations in reengineering process.
3. Elaborate the role of process chart in understanding the project.
4. Write a comprehensive note on the efficacy of seven-step approach to manage change.
5. Analyze how checking, control and contours contribute to a hassle-free reengineered process.
6. Discuss the crucial role of systems thinking for a smooth functioning in reengineering efforts.
7. Elaborate various elements of employee participation through BPR.

UNIT 4 EVALUATION OF PBR

NOTES

Structure

4.0 Introduction
4.1 Unit Objectives
4.2 Evaluation of PBR: An Overview
  4.2.1 Reengineering Success
4.3 Reengineering Revolution: A Paradigm Shift
  4.3.1 Need for Reengineering Revolution in Current Situation
4.4 Business Process Reengineering (BPR) vs Total Quality Management (TQM)
4.5 BPR vs Continuous Quality Improvement (CQI)
4.6 BPR vs Scientific Management
4.7 BPR vs Industrial Engineering
4.8 BPR vs Value Engineering
4.9 Criticism of BPR
4.10 BPR Can do Well
  4.10.1 Steps to Increase the Rate of BPR Success
  4.10.2 The Path Towards Betterment
4.11 Summary
4.12 Answers to 'Check Your Progress'
4.13 Questions and Exercises

4.0 INTRODUCTION

There are several factors which were found to be critical to BPR implementation success. The factors are teamwork and quality culture, quality management system and satisfactory rewards, effective change management, less bureaucratic and participative, information technology/information system, effective project management and adequate financial resources.

When reengineering is implemented in an organisation, the objectives of total quality must be kept in mind as the foremost to ensure success of reengineering. Otherwise, implementation can be costly and may not yield acceptable or long term results. BPR emphasises radically changing the existing processes, assuming that those changes will improve the firm's global performance or the performance of one of its specific processes.

However, in many circumstances, reengineering has not always lived up to its expectations. Due to the confusion surrounding BPR, and how it should be performed, many unsuccessful BPR attempts may have been made. Organizations were well aware that changes needed to be made, but did not know which areas to change or how to change them. Process reengineering is a management concept that has been formed by practical experience.

As more and more businesses reengineer their processes, knowledge of what caused the successes or failures is becoming apparent To reap lasting benefits, companies must be willing to examine how strategy and reengineering complement each other by learning to quantify strategy by accepting ownership of the strategy throughout the organization, by assessing the organization's current capabilities and

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process realistically, and by linking strategy to the budgeting process. Otherwise, BPR is only a short-term efficiency exercise. The eventual accomplishment of BPR rests on the individuals and their commitment level. These individuals have to have complete knowledge about the implementation of the BPR process.

The aim of this unit is to provide an overview of various factors for reengineering success, with particular emphasis on how an effective BPR can bring in transformative changes in organizations.

4.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Explain the evaluation process of PBR
- Understand the concept of reengineering success
- Explain the factors responsible for the BPR success
- Understand the relation between BPR and TQM
- Enumerate BPR in relation to scientific management, industrial engineering and value engineering
- Elaborate BPR as a long-term enhancement strategy

4.2 EVALUATION OF PBR: AN OVERVIEW

Payment by results (PBR) is a system of support funding that helps in making payments provisional on autonomous certification of results. Several governments are adopting this approach. According to the Department for International Development (DFID), PBR consists of three important features:

- Payments based on results
- Recipient discretion – the beneficiary has the liberty to select the method so that desired results are attained
- Verification of results as the initiative for expenditure.

According to OECD/DAC evaluation of PBR is defined as follows:

'Evaluation is the systematic and objective assessment of an on-going or completed project, programme or policy, its design, implementation and results…. Evaluation also refers to the process of determining the worth or significance of an activity, policy or program.'

The evaluation of PBR can be done using various approaches which are based on quantifiable and qualitative methods and both the approaches are able to provide detailed information about PBR.

4.2.1 Reengineering Success

According to the research undertaken by Michael Hammer (1990), Davenport and Short (1990), several organisations have considerably benefited due to the implementation of Business Process Reengineering (BPR). Some of the companies

which have successfully implemented BPR are: Ford Motor Co., CIGNA, and Wal-Mart.

Factors responsible for the success of BPR

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a. **Adjustments in the Work Culture of Management Systems:** These are related to all the changes and adjustments made by the management in order to provide human comfort. The introduction of various procedures and structures encourage people to work willingly. Many researchers have felt that this has been possible due to the components of BPR. The changes are in form of revising the reward systems, encouraging communication, empowerment, increasing people's participation, undertaking training programmes, adjustments and alterations. Changes in these areas have led to a change in the work culture and enhanced receptiveness of the people in the organisation towards the management.

- In order to attain reengineering success, it is essential to introduce new processes in the workplace so that people are encouraged to work. By means of BPR, different jobs are created and prevailing reward systems are not adequate. Hence there is a need to revise the system of rewards so that the BPR efforts are productive. The revised system of rewards will be fair and therefore result in better coordination between the employees. Presenting new designations will encourage people to ratify the re-engineering programme freely.
- Encouraging communication is another way of successfully implementing BPR efforts. According to various researchers, communicating with the audience all through the process of change is very essential. According to Davenport, 1993; Jackson, 1997; Zairi and Sinclair, 1995; Hammer and Stanton, 1995; Carr and Johansson, 1995; Arendt et al., 1995; Dawe, 1996, communication is required during the course of the change process at every stage and it is required with those who not related with the re-engineering project. Communicating effectively and understanding the structural alterations which need to be undertaken with all the internal shareholders as a well as external participant are essential for promoting a BPR programme. Communication needs to be straightforward and precise during discussions of crucial issues such as downsizing personnel.
- For successful BPR efforts, empowering individuals at all levels is necessary. This helps in making personnel of various levels to be in charge and responsible. Empowering staff encourages teamwork and self-governing as the individuals of all levels are allowed to take part in the remodelling the process. Once authorized, workers are capable of setting their own goals and monitoring their individual activities and take decisions which result in efficiency at work and thus provide backing to the BPR efforts.

Increasing people's participation helps in the success of BPR efforts as people get a chance to be actively involved in making decisions and they are involved at all stages. The line managers, process owners, and all workers should be consulted so that all are equally responsible during the implementation of the BPR process.

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- Educating and training people are very essential elements of effectual implementation of BPR. Researchers feel that in order to implement BPR successfully, the companies should make their staff members participate in several programmes so that they are adequately educated about the process. Organisations need to invest thirty to fifty percent more towards training programmes. These programmes have to focus not only on concepts which improve the skills and techniques towards BPR but at the same time enhance social and technical skills. The IT skills will help in better implementation of Total Quality Management (TQM). At the same time, it is crucial to enhance individuals' IT skills as this will lead to innovations which will help in reshaping organisational leadership and face competition. The training programmes are most beneficial for business managers, line managers, Information System (IS) managers, and various front-line staff members.
- Constructing a culture leads to successful implementation of BPR in the organisation. The prevailing culture of any organisation has a direct influence on the organisation's knack to adjust to change. In most cases, the prevailing culture is not beneficial for the reengineering setup. Consequently, the establishment needs to appreciate and adapt to the fresh beliefs, organizational procedures, and the styles of communication which are outcome of the BPR processes. According to the processes of an organisation which has been re-engineered, individuals generally have similar aims and are willing to cooperate with each other without the thinking of competition. Since BPR maintains teamwork and labour integration, this leads to collaboration and harmonization among workers. It is essential to have attributes like trust and morality among group members and the establishment.

Organisations need to be receptive towards change so that the BPR process can be successfully implemented. Resilience towards change helps the individuals in the organisation to be optimistic, motivated, malleable, controlled, and enthusiastic. In the course of occurring changes, the interactions between the people increase and they are liable to be influenced by internal as well as external forces.

b. **Competent Management:** Stability in the processes of the management help in guaranteeing successful implementation of the BPR efforts. The most obvious administrative activities which have a direct impact on the successful implementation of the reengineering process are extent of support from the top management, their level of commitment, encouragement, backing, and capability of taking risks.

   - Dedicated and resilient direction and leadership from the top management is an essential factor for BPR projects to be effective in the organisation. Leadership and direction has to be active, sturdy, evident, innovative and considerate so that the workers are able to be guided with clarity about future goals. The vision of the leader has to be interpreted well across the various levels of employees. The senior management has to be supportive and committed from the beginning till the end of the implementation of the BPR projects. The leader has to deal with organisational resistance during the implementation process in a very understanding as well as authoritative manner.

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- Providing encouragement and support during political, economic, and organisational risks are closely connected with the success of BPR-related changes. Support and encouragement during change helps the individuals to push themselves so that they are able to overcome the barriers. The top management plays a crucial role in persuading them to welcome change.
- Management of the risk is very important for organisational changes to take place. BPR operations result in bringing about several essential changes to the systems in the organisation. Risks related to accepting alterations to the various structures in the organisation like developing ITs, investing large amounts in acquiring new resources which are required for the latest procedures, rate of attrition, and unsure profits, are few instances outlining the risks which are undertaken by the organisation while effecting BPR. Hence, constant valuation of the risk has to be done while implementing the process so that it can be dealt with in the beginning and make it possible to effectively establish the re-engineering efforts. Forestalling and preparation of tackling the risk is necessary for effectively dealing with emerging risk in its initial stages.

c. **Structure of the Organisation:** Since BPR processes change the definition of various jobs and the responsibilities attached with the jobs, it is essential to create fresh structures in the organisation based on the teams of the BPR. The structure should be based on the new jobs and their responsibilities along with how resources are going to be utilised. According to researchers, a complete organisational human resource infrastructure has to be outlined so that the BPR process can be a success.

   The approach should involve designing structure which elaborates on jobs based on functions of the labour. According to Morris and Brandon, as people inside a process accomplish a sequence of responsibilities competently, level of the product quality, handling time, and cost are bound to be enhanced. Nevertheless, the initiative to assimilate human resources planning requires a cautious deliberation of all connected organisational changes.

   - BPR teams need to be effective throughout the implementation process. Teams need to be sufficiently cool, calm and collected. They need to have experience in several techniques so that they are able to react accordingly in variety of situations.
   - Team should consist of individuals who are from within the organisation as well as external associations.
   - The features of strong BPR team need to contain the following aspects: proficiency, their reliability and creativeness in the organisation, team empowerment, enthusiasm, leadership strengths, members should be well-trained in the techniques required for process mapping and brainstorming, appropriate administration of the team, corresponding abilities among team members, sufficient number of members, compatible responsibility, precision of approach for the work, and preciseness of goals.
   - Suitable job descriptions and distribution of duties are very essential since BPR brings about several changes in the structure of the organisation as a result of which several new jobs are created. The responsibilities and the

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duties of these new jobs have to be well specified for effective implementation of the reengineering processes.

d. **Effective Project Management:** Effective BPR execution is extremely reliant on an active BPR programme management. This contains sufficient strategic arrangement, strong planning and effective techniques of managing projects, recognition of performance measures sufficient capitals, suitable utilisation of procedures, adequately oriented about the external environment, well utilisation of specialists and consultants, developing futuristic vision, operative redesigning, collaborating BPR with various upgrading systems and sufficient realisation of the effectiveness and benefits of the BPR.

- Supporting BPR strategy in line with the strategies of the business will help in utilising the resources of the organisation towards controlling competition. The BPR strategies help in guiding the changes in the jobs and channelize them towards the processes which become the cause of competitiveness. Hence, a deliberation over business strategies which are working towards growth and expansion and encouraging change need to be carefully aligned with the strategies of the reengineering process so that it can be implemented successfully.
- Appropriate preparation and using the correct technique at the right time are considered a crucial factor contributing towards the success of BPR project. Operative utilisation of project management techniques and managing staff related problems are required for smooth functioning of reengineering process. According to Hammer and Stanton, complete directing of the fresh design and learning from mistakes are required for creating a smooth path for the implementation of the BPR process. Measuring the progress made by the project during its implementation is considered very essential for the project. Identifying and establishing high standards of performance will help in achieving higher goals and greater objectives. The success of reengineering process is dependent on having sufficient resources and adequate funding.
- Suitable usage of methods in a disciplined manner is crucial for the success of BPR. A BPR approach ought to be premeditated and carefully chosen so that it can meet the existing requirements of the organisation. BPR methodologies should be sufficiently customised to meet the requirements of the organisation. The extent and the detail till which the methodologies can be customised reflect on the extensiveness and usefulness of the methodology.
- External orientation and knowledge created on customer research, scrutiny of the competition, and benchmarking are some of the vital elements of efficacious BPR efforts. Benchmarking is considered as a relevant method which involves learning from the consumers and opponents. The needs and wants of the customers should be specified and measured for BPR as only then the process can be valuable for the customer as well. Benchmarking helps in gaining knowledge from the experiences of the other organisations along with learning reengineering process of the particular organisation.
- Utilising the experience of the specialist is considered essential for effective implementation of the reengineering process. According to various

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researches, it has been noted that the consultants provide adequate guidance to the team members during the implementation of the process and due to their experience, they can anticipate the failures at an initial stage and rectify before it harms the whole process. The organisation can benefit from the consultants with specialised skills, experience, and expertise which are not possible within the organisation internally. At the same time, it is essential that the consultant is completely neutral and handles all the situations in a completely unbiased manner. The organisation must select a specialists whose experience will be beneficial during the implementation of the BPR process.

- In order to successfully implement BPR, there has to be a futuristic vision so that future processes can be imagined. Having a vision about the processes is useful in directing routine jobs as well as the long-term processes. A comprehensive expansion of process vision takes account of assessing corporate's approach to forestall future processes, piloting consumer-related valuation of performance targets, benchmarking and other BPR efforts.
- The redesigning of the processes has to be undertaken in a systematic manner with adequate orientation and knowledge of the existing processes. Effective documentation and choosing the correct fundamental processes are important for successful implementation of BPR. The redesign process should be done so that loopholes in the prevailing processes can be overcome and repaired by adapting suitable software. Another crucial aspect of effective reengineering is to recognise the process owners.
- Incorporating other improved approaches with the BPR is bound to successfully implement the process. According to many researchers, applying various continuous improvement techniques such as TQM or CQI along with BPR are useful during the reengineering process.
- Sufficiently identifying values and avenues within the organisation as well as externally is useful for the BPR efforts. However, focus should not shift from the existing objectives of the corporate and they should be maintained throughout the process.

e. **IT Infrastructure:** According to many researchers and specialists, IT infrastructure is a vital element in determining the success of the reengineering efforts. In order to effectively implement BPR, there is a need for accurate alignment of the BPR approaches with the IT infrastructure. Constructing an operative IT infrastructure, sufficient investments for an effective IT infrastructure, appropriate incorporation of IS, enhance capability of IT functions, and effectively utilising the available software tools are needed for the success of the reengineering efforts.

- Adequate alignment of IT infrastructure and the BPR strategy should be a part of the overall strategies of the organisation. IT can effectively upgrade the position of the organisation by focusing on the core strategies of the business. It is very important that the business strategies are outlined clearly and the top management is committed towards the process of BPR. The IS managers need to be accountable for the constructing and executing the IS strategy. The strategy defines the role of IT in enabling changes in the existing business processes and structures. The process of integration determines

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the extent of alignment in the strategies of IT infrastructure and the organisational infrastructure. The success of the BPR processes completely rests on the amount of harmonization in framing the two strategies.

- Constructing an operative IT infrastructure has been considered as an important factor by several researchers. There is a need for sufficient IT infrastructure re-evaluation and structure. Adequate understanding and identification of enabling technologies for redesigning business processes, appropriate assortment of IT platforms, building of an efficient overall system, adjustable and supple IT infrastructure, and accurate setting up of IT mechanisms are essential aspects for a strong IT infrastructure which can support business processes.
- The BPR and IT infrastructure are closely linked as any fresh business process can be initiated only after realising the components of the IT infrastructure. Constructing a receptive IT infrastructure is extremely reliant on a suitable understanding of the business process information requirements. This is outlined with the help of activities inserted in a business process, and their relevance and dependence on various processes of the organisation. An IT infrastructure contains physical resources, scholarly resources, collective services and their associations. An operative IT infrastructure arrangement process is based on a top-down approach, which starts with business strategy and IS strategy and passes towards plans of data, systems and computer structural design.
- Sufficient investment has to be made in order to fulfil all the strategical requirements of the IT structure. This investment is important in the success of the BPR projects as most of the reengineering efforts need the support of components of the IT infrastructure. The corporate strategies must guide adequate investment and these strategies should be modest, attainable, concrete and easily interpreted by all in the firm. Depth of the IT infrastructure efficiency exhibits the IT deficits prevailing in the system once business process information resource necessities are not achieved by the existing IT infrastructure competences.
- There has to be effective collaboration between different organisational IS for the effectiveness of the reengineering process. This collaboration can be checked by measuring the degree of linkage between different information systems when providing information whether it is comprehensive, constant, precise, and well-timed information among business processes. For IS collaboration to be complete, there has to be integration of data integration and presence of a strong communication network. The efforts of data integration will be successful only if there is collaboration between organisational planning and IS planning, complete support from the superiors, involvement of the consumers, stable and strong leadership, meaningful communication, methodical implementation, Interdepartmental collaboration, and flexibility at lower levels.
- Enhancing the capability of the IT functions so that they can quarter the essential changes in technology as well as business is very essential for the BPR efforts to be successful. Proper IT function arrangement, suitable

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construction of IT management, constructing efficient IT function, effective benchmarking of the IT function, and proper performance measurement of IT function: these are some of the aspects of IT functions which are essential for reengineering. Reusability of the systems is another significant factor that promotes the re-engineering efforts.

- The participation of workers who are responsible for maintaining the system are useful for the efforts as they are tuned to the legacy of the IT systems. An operative IT function has to be intended for a complete and supple structure. The objectives of such a system are focused on quality, creating value and providing services, empowering with the help of learning and enhancing the skills of IT personnel, providing inspiration to workers, corporations and trust amid groups handling IT resources.
- Effectively utilising the software tools is bound to help the efforts of reengineering and attain success. Usage of software tools helps in enhancing productivity which directly contributes towards the success of BPR. Proper use of software tools helps in timely completion of projects. Production of better quality services and saving costs help in reducing work load and cuts off the wasteful tasks.
- Proper utilisation will be possible only if the software tools have certain features such as, easy to use by individuals without a technical background, process conception, the capability to examine processes and display information movements amid stages along with degrees of flows and level of utility of resources, improving the precision of the vision of the BPR team members, allowing the consecutively of life reproductions to determine logjams and restraints, administering reliability in investigation and design, enabling collaboration with CASE tools as these are commonly used in planning BPR's essential information systems, and providing an adequate return on investment.

4.3 REENGINEERING REVOLUTION: A PARADIGM SHIFT

With the initiation of the cryptocurrency, the society is preparing for a fresh and extensive revolution in the technological world. The impact of these technologies is going to be very dramatic and will need a shift in paradigms. The long-standing solutions and the traditional method of performing tasks are going to become outdated. Hence in order to sustain in the competitive world, the businesses need to plan the reengineering revolution. Inventions initiate changes which are accompanied with risks. Nonetheless, at the same time, change allows availability of new and incredible prospects. The process of reengineering allows the businesses to get rid of the old systems and processes which are time consuming as well as expensive. The process helps in replacing the old processes with processes which add more value for the consumer.

As has been discussed, reengineering is correspondingly referred to as Business Process Reengineering (BPR). It has been elaborated by Dr. Michael Hammer and Dr. James Champy with the following definition: 'The fundamental rethinking and radical redesign of the business process to achieve dramatic improvements in critical

Check Your Progress

1. Name some of the companies which have benefited from the implementation of Business Process Re-engineering (BPR).
2. What are the main factors of BPR success?
3. How does adjustment in culture help in implementation of BPR efforts?
4. How does the leadership play its role?
5. Why is an operative IT infrastructure considered as an important factor for BPR success?

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contemporary measures of performance, such as cost, quality, service, and speed.' Through this definition, Hammer and Champy have tried to stress on four essential elements of reengineering which give it a revolution like status: fundamental, radical, dramatic, and process. In this, process is explained by them as, 'a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer.'

In the early 1990s, at the outset of the reengineering revolution, Dr. Michael Hammer familiarised the concept of reengineering revolution with the help of his article which was published in the Harvard Business Review under the title of *Reengineering Work: Don't Automate, Obliterate*. Through his article, he demands the businesses to reengineer by means of "the power of modern information technology to radically redesign our business processes to achieve dramatic improvements in their performance." Later, Dr. Hammer and Champy wrote their important book, '*Reengineering the Corporation: A Manifesto for Business Revolution'*. With the help of this book, the authors asserted that "information technology acts as an essential enabler to reengineer, and that without information technology, the process could not be reengineered."

4.3.1 Need for Reengineering Revolution in Current Situation

The companies face enormous challenges in current set up due to unsettling technologies. These technologies alter the environment and construct ambiguity and risks. In order to sustain in this ambiguous environment, competitive companies try to work out avenues which will help in reducing risks and increase the opportunities which will help in maintaining lucrativeness and competitive advantage. Reengineering processes demand from the managers that they must specify objectives which are ambitious and require new business processes. To accomplish this, managers may choose the various corporate strategies such as reengineering.

There are several management methodologies which help in management of change like Organization Development (OD), Total Quality Management (TQM), and Lean Six Sigma. The managers can opt for Business Process Management (BPM). Few may consider creating and implementing methods which are completely new and more advantageous. However, they need to understand that all methods for change are bound to have challenges during implementation. Be aware, though, that each of these strategies involves colossal implementation challenges. Reengineering, clearly, strives towards wiping out the existing processes so that fresh systems can be introduced. The process of reengineering tries to work towards betterment of all resources of business including human resources.

4.4 BUSINESS PROCESS REENGINEERING (BPR) VS TOTAL QUALITY MANAGEMENT (TQM)

Total Quality Management (TQM) and business process reengineering (BPR) are related concepts as both are based on cross-functional relationships. In order to clearly understand these two concepts, the difference between them has to be understood. Total Quality Management focuses on increasing productivity by improving the quality whereas Business Process Reengineering focuses on improving the processes so that

Check Your Progress

6. What do you understand by reengineering revolution?
7. State the significance of reengineering revolution in current situation.

there is enhancement of productivity. The improvements in the process are done by redesigning the existing processes and introducing latest technical know-how. The aim of both the concepts is to enhance the organisational efficiency.

Objectives of Total Quality Management (TQM)

The objectives of Total Quality Management (TQM) are based on the following principles:

- Need to produce quality yield from the beginning
- Stresses on fulfilling the expectations of the consumers
- All strategies are aimed for non-stop enhancements
- Inspiring reciprocal reverence and co-operation

Advantages of TQM

Using the TQM philosophy helps in achieving the following aspects:

- Creates a competitive organization
- Introduces a culture which promotes expansion and improves the prospects of future growth and success
- Generates a dynamic and cordial atmosphere which allows all to excel
- Aids in reducing stress-levels
- Reduces wastage and provision for rectifying faults
- Encourages partnerships, teamwork and collaborations.

Business Process Reengineering (BPR) leads to alterations in the structures and processes inside the corporate setting. Hence, these alterations may be in the form of technical expansion which reduces the manpower requirements. Technical operations will improve the organisational productivity. BPR helps in increasing the adaptability of the business to sustain the corporate competition. Business processes are distributed into three components namely, inputs, process and outputs. The BPR helps in reducing the cost and improving the time taken for delivering. Referring to the definition provided by Hammer and Champy, reengineering is the thorough designing of the business processes so that performances can be improved along with cost, value, facility and rapidity.

Objectives of BPR

The chief objectives of BPR can be outlined with the following factors:

- Focuses on customer satisfaction
- Rapidity by using progressive technologies.
- Reduces cost and financial investment by undertaking numerous activities in a specific process.
- BPR is flexible as it can easily adapt itself towards altering conditions and consumer needs.
- Helps in maintaining and improving quality. The standards are maintained by keeping a close check on the processes.

- Helps in allowing the leaders to be innovative. This helps the organisation to deal with competition.
- Enhancement in competence and usefulness helps in increasing productivity.

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Advantages of BPR

- BPR is helpful in understanding customer requirements and aids in providing adequate focus on them in the business.
- BPR offers cost benefits which help in putting the organisation in a strong position to be able to handle competition.
- BPR emboldens enduring strategies which help the processes to handle various demands of the future.
- BPR helps in overcoming short-term approaches which are an outcome of limiting the functions of a process. As the efforts of BPR try to focus on large processes which have the capacity to perform multiple activities simultaneously.
- BPR simplifies the structures of the organisation by doing away with low value actions.

Difference between TQM and BPR

Since TQM and BPR concepts have a cross-functional relationship, it is helpful to know the difference between TQM and BPR for a better understanding of these concepts. These are as follows:

- Both TQM and BPR are based on a cross-functional relationship. TQM tries to improve productivity with help of improving the quality whereas BPR works towards improving processes by redesigning and making technological changes.
- TQM focuses on non-stop developments whereas BPR aims at product improvements.
- TQM stresses the usage of statistical process control whereas BPR stresses the implementation of IT infrastructure.
- TQM can be implemented using either top-down or bottom-up approach whereas BPR uses only the top-down approach for its implementation.
- TQM are constructed on consumer satisfaction. An organisation uses TQM so that it can endure or overtake the expectancies of the consumers so that they can get a reputation of an organisation which provides superior quality product. It is a system which explores consumer's perception whereas BPR is a system which explores changes in the processes to improve efficiency.

Steps of Implementing TQM

- Outlining products
- Forming the team for the project
- Understanding the mission
- Recognising the target audience
- Determining the needs of the customers

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- Developing product specifications
- Determining the process of the team
- Detecting the cost of the production
- Assessing the productivity in relation to customer satisfaction

Steps of Implementing BPR

Reengineering process is implemented in four stages. These are:

Stage 1: This is often referred to as 'To Be' as in this stage visualises the needs of the organisational processes.

Stage 2: This is referred as 'As Is' since it defines the existing processes which need to be redesigned.

Stage 3: This stage formulates the plan and elaborates the shift which is required for moving ahead from the stage two. The stage outlines the degree of redesigning the process.

Stage 4: This is referred as 'The Crossing' as this stage involves the final implementation of the process.

There are many differences between the two concepts but they have three elements in common which an organisation wants to achieve by adopting either of the concepts. These are: speed at which the product is delivered, cost effectiveness and producing high quality products which provide consumer satisfaction. Both concepts need complete commitment from the top management and the workers. In the absence of their support and commitment, success is not possible during and after implementation of the concepts. Both focus on effective leadership and teamwork.

4.5 BPR VS CONTINUOUS QUALITY IMPROVEMENT (CQI)

The association between continuous quality improvement and business process reengineering has always been a topic which has attracted numerous debates. The two approaches are different yet similar in few aspects. They both work towards improving the systems of the organisation but while doing this task, their focuses are on different aspects of the system. The changes in a system are bound to enhance the improvement possibilities of the productivity in the organisation.

According to Hammer and Champy, reengineering is the "fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measure of performance, such as cost, quality, service and speed." In order to accomplish these radical improvements, efforts have to be made to establish relations. According to the systems theory, relations largely regulate performance of system. Hence, system relations are given lot of stress in the reengineering process whereas, CQI attempts at improvements which are not so radical in nature. These improvements generally stress on the specific parts of a process or system.

Check Your Progress

8. State the relation between BPR and Total Quality Management (TQM).
9. List the principles on which the objectives of TQM are based.

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Continuous Quality Improvement (CQI)

The approach of quality management constructs around existing quality assurance techniques. In this method, the focus is on the process of the organisation rather than the individuals working in the system. Equal stress is paid towards recognising consumers within the organisation along with the ones from external setting. CQI endorses the necessity for objective information in order to evaluate and enhance the processes. As a management philosophy, CQI argues that all processes can be enriched. The philosophy is based on principles of scientific methods and tries to bring improvements by means of undertaking experiments. The method is applicable to most routine activities of an organisation so that they can be improved and the consumers can be served better.

Principal Concepts of CQI

It is important to know the principles of continuous quality improvement (CQI). These are as follows:

- Quality is determined by providing the needs of the customer or better than their anticipations.
- Achieving success means to fulfil the requirements of those who are served by the organisation.
- People working in the process are not at fault, it is the process which needs to be improved in case results are not achieved.
- Unintentional alterations in processes will result in changing the outcome. Hence unintentional alterations should be completely avoided.
- There is a possibility to attain constant enhancement with the help of minor changes when methods are scientifically applied.
- Constant enhancement is extremely useful as it allows functioning in a normal routine.

Steps in Continuous Quality Improvement

These are the seven steps to get started with Continuous Quality Improvement. These are as follows:

- Creating the team which is knowledgeable about the requirements of the system that needs to be improved
- Identification and defining the aims clearly
- Figuring out and understanding the requirements of the individuals who are going to be benefitted from the system
- Quantify the levels of success
- Innovate and workout the probable modification strategies which will lead to enhancement
- Plan, assemble, and utilise information which will help in making relevant decisions for the process
- Use scientific method to experiment and improve changes.

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CQI has been identified as a system which aims at improving the provisions of services by emphasising on long-term outcomes. Corresponding to total quality management, CQI also practices fixed statistical tools in order to comprehend subsystems and expose complications. However, its stress is on preserving quality in the long run besides managing the process. As soon as the process that has to be improved is recognised, a group of experienced people is congregated who are responsible for researching and documenting all the steps of the process. After complete anticipations and the methods of measuring the anticipation are decided, these steps are constructed which help in curtailing failures in the long run. For this also goals are established and efforts for educating and measuring the outcome. In order to maintain constant improvement, the plan may be reworked so that desired results can be attained. CQI is a diagnostic decision making tool that permits the system to verify the workability of the process and take timely corrective measures. It is common for all processes to have discrepancy but CQI helps in identifying unintended discrepancies and then helping to improve them.

The groundwork for CQI was done by Dr. Walter Shewart in 1920s when, while working at the Bell Telephone Laboratories, he conducted various researches to find ways to enhance quality along with cost effectiveness. He established the model of control in relation to variation. He used various CQI charts to analyse control in process. Dr. W. Edwards Deming took the model further and it was taken to Japan after the Second World War and here it was incorporated into the Japanese industry willingly. This led to Japan producing numerous quality products that were popular all over the world. In Japan Dr. Deming is considered as "God of quality". In the present day, CQI is adopted globally and it is most prominently used in Healthcare along with several other service industries.

While performing the specific step of identifying the process, CQI has a number of tools and procedures to follow. There are eight quality tools which help organizations to completely understand and enhance their processes. The important tools for the discovery process are: Check Sheet, Cause-and-Effect, Diagram Flow Chart, Pareto Chart, Scatter Diagram, Probability Plot Histogram, Control Charts, and Brainstorming

Factors for Effective Workflows with CQI

Measuring organizational context in CQI evaluations is key to understanding the conditions for success, and for identifying factors that could be targeted by CQI implementation strategies to enhance uptake and effectiveness. Some of the factors for effective workflows are given below. These are:

1. **Optimum amount of steps**: The process tries to accomplish the workflow with required number of steps and completely avoids undertaking extra or unnecessary step. The unwanted steps increase the possibility of making mistakes. Rationalized processes reduce the chances of failure and faults.
2. **Precision of roles:** Every individual who has a part in the workflow is completely aware about their task and accountabilities. These are clearly specified in the workflow. The steps which are performed by multiple individuals are also clearly mentioned so that there is clarity.

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3. **Timeliness:** The time of delivery is very essential to improve quality. The waiting time has to be reduced so that the timelines can be maintained. CQI works towards reducing the time gaps between steps so that efficiency is maintained and better consumer satisfaction is provided.
4. **Focused on Consumer:** The final test of quality can be judged from the levels of consumer satisfaction and their overall experience. Workflows which are effective, constantly try to judge the worth of the steps in the workflow in relation to their benefit for the consumer. CQI is the method which helps in promoting welfare, suitability, efficiency, fairness, luxury, and fulfilment and be reverential towards the personal preferences of the client. They try to develop services keeping in mind the cultural and religious background of the consumer.

4.6 BPR VS SCIENTIFIC MANAGEMENT

As mentioned before, BPR is the examination and restructuring of the workflow inside the organisation. BPR is a technique which supports change so that new processes and updated working styles can be introduced within the organisation. BPR aids in introducing various aspects which help in bringing about change. These aspects are referred to as enablers and they can be described as means of process change. Several organisations have implemented BPR efforts in order to bring changes to their system but not all have benefited from this process. Some have only been successful in finishing the spirits and impetus constructed in the past. The reason for failure of most BPR efforts can be associated to the misperception about its objectives and steps of implementation. Most organisation realise the need for change but at the same time, they fail to precisely pin-point the area which has to be focused during the change and the extent of the change.

Scientific management and BPR are closely related to each other. Scientific management can be understood as the theory of management that applies science in order to analyse and create workflows so that efficiency can be enhanced and the human as well as capital resources of the organisation can be utilised completely to increase productivity. It was one of the earliest attempts to apply science to the engineering of processes and to management. Scientific management is occasionally identified as Taylorism as it was founded by Frederick Winslow Taylor. The scientific management is used to experiment the assumptions inbuilt in the processes of work prior to the advancement in the technology and computers. Scientific management tries to systematically revamp the way all business should be performed and tries to go beyond the forces of automatization or mechanization. According to several researchers and consultants, scientific management is one of the essential components for successful implementation of BPR efforts. Furthermore, the superiors in the management need to perform the task of formulating strategies which keep the workers committed to the entire process of redesigning. These strategies involve the adaptation of scientific management along with BPR so that changes can take place within the processes and the infrastructures. With the help of scientific management, BPR can be applied to medium as well as small business enterprises. Small and Medium Enterprises (SME) might attain great benefits by implementing BPR.

Scientific management: It is a theory of management that analyses and synthesizes workflows. Its main objective is improving economic efficiency, especially labour productivity.

Check Your Progress

10. What do you understand by Continuous Quality Improvement (CQI)?
11. List the principal concepts of CQI

Benefits of Integrating BPR and Scientific Management

Businesses can experience various benefits due to the successful implementation of BPR and information technology. These are as follows:

- This will help enterprises to conduct transactions with various clients such as dealers, producers, distrusters, banks, etc.
- Innovative IT solutions can be easily implemented, for example, e-commerce, e-business, etc.
- Enhanced promptness of comebacks
- Cost efficiency
- Enhanced communications, opportunity to share information and knowledge; declines in accounting
- Enhanced efficiency and productivity
- Co-ordination and regulation of procedures
- Better allocation of procedures and processes
- Getting hold of new customers and amplified sales
- Advanced customer service

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Understanding the 'Principles of Scientific Management' and Taylorism

Frederick Winslow Taylor and his confidants were the pioneers to research the work processes in a scientific manner. They deliberated on the procedures involved while performing work, and its impact on the efficiency of the workers. Taylor believed that the method and effectiveness of the task was more important than the amount of labour which was incurred while performing the task. He published "*The Principles of Scientific Management"* in 1909 in this he suggested that through improving and streamlining jobs, efficiency will definitely increase. He further suggested that there should be high level of cooperation between the staff members and the managers.

These suggestions were completely new during that time as corporates did not operate in such a manner. The managers of the factories did not interact with the workers and they were only interested in the production of the products. The businesses completely lacked standardization and the workers were not motivated to work. Their only interest was to secure their employment. The workers were not given any incentives that would have inspired them to be efficient or quick in their work. Taylor assumed that monetary benefits were the only motivation factor for the workers. He was the one who initiated the notion of "a fair day's pay for a fair day's work." That means the worker had to daily complete sufficient work in order to be entitled to be paid equally as the other workers who worked more efficiently. Due to his background of mechanical engineering, efficiency was of great importance to Taylor.

During his work in USA with a steel manufacturer, he created various workplace experiments to establish optimum levels of performance. He used the scientific method to learn the optimum method to perform various tasks which were performed at the workplace. He realised that if the time needed to perform a task was calculated then efficient ways of concluding a task can be developed. These studies were referred to as "time and motion" studies. These studies helped him to realise that all workers had

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different efficiency levels while performing the similar tasks. On the basis of his studies and experiments, Taylor outlined four principles of scientific management. These principles are sometimes referred to as "Taylorism".

Four Principles of Scientific Management

1. Scientific methods should be used for determining the most efficient way of performing a task rather than just performing it as an unpretentious pattern and routine.
2. Workers should be assigned work on the basis of their capability and enthusiasm. The workers who lack the two qualities should be trained and motivated for the job so that maximum labour productivity is attained.
3. The workers should be closely monitored in order to assess their performance and to provide supervision so that they are able to deliver as per the other workers.
4. Distributing the work amongst managers and workers will help the managers to be able to interact and train the workers. This will help the mangers to plan better and lead to better performance of the task.

Critiques of Scientific Management

Taylorism tries to endorse the notion that a task can be performed efficiently and correctly in a single manner. It has been criticised for "one right way" notion by the promoters of various latest approaches such as MBO (Management by Objectives), continuous improvement initiatives, BPR (Business Process Reengineering), and other managerial tools. The other approaches promote individual responsibility, and consider that the task of decision making should involve the workers as well as managers. Unlike scientific management, others believe that the workers should have adequate authority to take decisions while performing the task so that they can use the most workable solution while completing a task. The front line workers need flexibility so that they can function smoothly in fast changing environs. When the organisations are not flexible they are unable to react as per the need of the hour.

According to latest approaches, teamwork is very essential and scientific management overlooks the relevance of this in an organisation. Taylorism stresses on how each individual is going to perform the task efficiently. Current approaches have a preference of examining work systems in a more holistic manner when calculating the level of efficiency and output. Modern theories are not in favour of severe specialisation which is a feature of Taylorism. The ideas of providing sustaining work environment and motivation techniques are also contradictory to the current approaches. Scientific management tries to completely segregate manual labour from intellectual work, whereas the current efficiency improvement approaches try to include worker's designs, knowledge and information into formulating the work processes. Scientific management purely stresses on the mechanical aspects and due to which it undermines the role of humans as a crucial factor contributing towards success of an organisation.

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4.7 BPR VS INDUSTRIAL ENGINEERING

Frederick Taylor transformed the workplace with his concepts on work organization, task breakdown, and job quantity. Taylor's elementary goal was to enhance the productivity of the organisation by applying principles of engineering to human labour. He felt that concepts of engineering principles which were able to resolve technical issues when applied to work force and efficiency issues will provide the desired solutions.

Industrial engineering is compilation of Taylor's practical understandings. For a long time none of the other concepts have been able to match the mechanised vision presented by Taylor. However, two current tools, which are considered helpful in changing organizations on the lines of industrial engineering, are the advent of information technology and business process redesign. The competence presented by computers, software applications, and telecommunications is very useful in increasing the productivity of the organisation. Business process redesign helps in analysing and designing the processes and the work flows within these processes. Together, both these tool have a capability to construct a latest version of industrial engineering, altering the manner in which the tool is used and skills required to use the tool.

The branch of engineering which works towards optimizing multifaceted processes, systems, or organizations is referred as industrial engineering. The task of industrial engineers is to engineer methods which will help in optimum utilisation of time, capital, resources, work-hours, machine time, and power. They also work in eradicating resources which are not useful for the processes of the organisation. With the help of industrial engineering, processes and systems are created which help in improving quality and efficiency. Industrial engineering is concerned with the expansion, enhancement, and enactment of integrated systems of people, funds, data, information, machinery, power, resources, exploration and synthesis, along with the mathematical, physical and social sciences. The principles and techniques of engineering design are used to identify, forecast, and assess the outcomes which have to be attained from the systems or processes of the organisation. Although industrial engineering is an age-old engineering discipline, its concepts have a close relation with the subject to (and eligible for) professional engineering licensure in most jurisdictions; its underlying concepts overlap considerably with certain business-oriented disciplines such as operations management.

Industrial engineering sometimes overlaps with other operational tools such as systems engineering, manufacturing engineering, production engineering, management science, management engineering, ergonomics or human factors engineering, and safety engineering.

Frederick Taylor is frequently considered as the father of the industrial engineering discipline. The origin of the concept is clearly visible in his two books, "*Shop Management*" and *"The Principles of Scientific Management"*. According to him, the principles of industrial engineering helps in improving methods of performance.

Principles of Industrial Engineering

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1. Enhancement of work methods
2. Developing work standards
3. Improvements in work efficiency
4. Reducing time taken to perform a task

All the principles of industrial engineering are in sync with the principles of scientific management. Taylor's faith in scientific methods made him contribute immensely towards realising the importance of precision and predictability of time required in performing a task. The time study helped in improving efficiency of the workers.

The American Institute of Industrial Engineering was formed in 1948. The initial efforts of F. W. Taylor and the Gilbreths have been accepted by the American Society of Mechanical Engineers as they act as a guide for understanding the performance of the complete manufacturing processes. The work of Henry R Towne also provides a good insight into the principles of the industrial management in his paper, "*The Engineer as An Economist*".

The 1970s saw the relevance of the timing along with the development of decision support systems in supply like the Material Requirements Planning (MRP). In this emphasis on issue of timing was seen during processes like inventory, production, compounding, transportation, etc. in industrial organization. In 1976, CMMS programs were installed by the Israeli scientist Dr. Jacob Rubinovitz. This program helped the organisation to cope, upkeep with operations, resources, equipment and compliance. The industrial engineering was applied in Japanese management systems. These theories were referred as the Kaizen and Kanban approach. Japanese industry was aiming to achieve very high intensities of quality and efficiency. These theories helped in improving the problems of quality, supply time, and flexibility. Soon the theory of Kaizen was implemented in the west in various CQI and various improvement programs. In the nineties, due to the process of industrial globalization, the industrial engineering was useful during the management of supply chain, and consumer-oriented business process design.

4.8 BPR VS VALUE ENGINEERING

Business process reengineering (BPR) may be described as selection of integrated efforts which aim at achieving specific level of productivity. BPR is a planned, well thought out set of actions which are created to get a desired amount of produce for a specific consumer or industry. Refining corporate processes is essential for companies so that they can compete in the market. In modern times, in order to meet the demands of the customers, the companies have no options but to employ BPR so that they are able to provide better products and services. Several companies start business process enhancement by adopting a continuous improvement approach. The BPR methodology consist of evolving the vision of the business and improving the processes, recognizing the processes that needs to be recreated, evaluating the existing processes, outlining the level of technical advancement required and creating the infrastructure so that the new process can be built. BPR processes need to be completely supported by all

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12. Who authored "The Principles of Scientific Management"? What do you mean by Taylorism?
13. Explain the concept of Industrial Engineering.
14. List the principles of Industrial Engineering.

levels of the organisation and the top management has to be completely committed. Value engineering is an essential part of BPR as it helps in providing ways of reducing cost without sacrificing on quality. It is a resourceful approach which helps in eliminating the redundant expenses which do not contribute towards quality or aesthetic value of the product. It is a methodical presentation of practices which recognize the utilities of a product or a component and provide the anticipated utility in less cost.

Explaining the Value Engineering

The word 'value' is a very relative word and is mentioned by people without clear understanding of the term. In companies as well, each department has a different understanding of 'value' and its purpose. In the corporate world, value is mostly referred in the context of economic worth. **Value engineering** or value analysis is a structured methodology that helps in identifying superfluous costs attached to the product, process or service. It helps in engineering the economic worth of the product or the process. The tool of value engineering is used in businesses to help in eliminating unwanted actions and steps which do not have an impact on the efficiency of the process and maintaining quality and reliability of the process.

Value engineering (VE): It is a systematic method to improve the "value" of goods or products and services by using an examination of function.

According to Society of American Value Engineers (SAVE), "Value analysis is the systematic application of recognised techniques which identify the function of a product or services to establish a monetary value for the function and provide the necessary function reliability at that lowest overall cost."

According to production engineer of General Electrical in USA, Lorry D. Miles, "Value analysis is the study of the relationship of design, function and cost of any material or service with an object of reducing its cost through modification of design or material specifications, manufacture by more efficient process, changes in sources of supply, elimination or incorporation into another item."

Principles of Value Engineering Process

Principles of value engineering process are as follows:

1. Practical examination to outline the purpose for the presence of a product or its components
2. Resourcefully examining the substitutes for developing fresh and improved alternatives.
3. Helpful in measuring the assessment of value of current and long-term concepts.
4. Exposes and eliminates unwanted costs
5. Method which helps in analysing functional cost of products and endorse the changes
6. Helps in improving the value of the product

Value Engineering is a corrective process. It is used when a new product is starting to be designed so that unwanted features are dismissed at an early stage. The method acts has a preventive measure. BPR is a tool which is implemented when improvement is required in the process. The tool is a remedial process.

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Implementation of Value Engineering and BPR

1. BPR is concerned with the post production stage whereas Value Engineering (VE) is concerned with both pre- and post-production stages.
2. BPR is concerned with analysing techniques which are used in processes and tries to improve them. VE identifies the function which will help in providing cost-efficiency and then redesigns the product based on those functions.
3. VE is not just focused on improving the cost but tries to improve the quality, consistency, upkeep, security, usability and aesthetics of the product. BPR is focused on improving the process and bring changes for improving the process or if changes are not possible it replaces the process with a new one.
4. Value engineering is a part of all improvement tools of management as it helps in strengthening the efforts of reengineering process.

Steps of Value Engineering

The exercise of value engineering consists of the following stages

1. **Commencing**: The first step is to formulate the team of value engineers so that the task can be defined.
2. **Familiarisation**: A proper examination is conducted in order to define the role and utility of the product. The cost and relevance of each function are recognised.
3. **Invention:** In this, new alternatives are created to replace the inefficient functions.
4. **Appraisal**: Each alternative is evaluated and the one with maximum technical and monetary viability is selected. The chosen alternative should be able to perform adequately.
5. **Selection:** A report is submitted to the engineers who decide on the alternatives which are selected.
6. **Implementation**: The alternative which is selected is implemented to check its usability.
7. **Progress:** In this step, the selected alternative is closely and constantly monitored. The provision for rectification is provided and all doubts regarding the functioning are clarified.

Advantages of Value Engineering

Value engineering is a useful method for reducing cost and improving quality and has many advantages in the companies that use this as an improvement technique. Advantages of Value Engineering are:

1. It helps in improving the design of the product or service
2. Quality is preserved
3. It helps in doing away with wastage
4. Cost effective
5. It generates fresh and latest concepts and products
6. It helps in better team coordination
7. Unkempt parts are highlighted

8. It provides tangibility to unqualified aspects during decision making
9. It can be applied to various processes
10. Helps in improving the company's image and promotes the brand.

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Value engineering is not free from criticism. The technique is often considered just as a method which helps in reducing costs, hence it is often considered not applicable for other improvement programs. It fails to motivate the workers and is not open to change. The technique is criticised for being sluggish and most engineers put into practice the tried and tested methods as they are afraid of competition. The limitations are not difficult to overcome and it needs managers to be adequately educated about the concepts and have enough patience for effective implementation of the technique.

4.9 CRITICISM OF BPR

Eliyahu M. Goldratt has commented in his '*Theory of Constraints*' that reengineering is unable to deliver a useful method to concentrate enhancement efforts on the organization's constraint. Researchers, who have analysed the process of reengineering closely, feel that several businesses use the excuse of BPR as an opportunity to downsize the workforce of the organisation though, in reality, this is not the purpose for which reengineering is implemented. In several situations, reengineering has failed to meet the anticipations.

Explanations for Criticisms of BPR

Few noticeable explanations take account of following factors:

- Reengineering automatically concludes that all inefficiencies in the level of performance of an organisation are due to its faulty processes. This is not a substantial way to validate the theory.
- Reengineering tries to disregard all the existing processes and stresses that improvement is possible only after the existing processes are replaced by advanced technology.
- Few researchers have established that reengineering is not a recent concept. In fact, it has been traced back to 1908 when assembly line was introduced by Henry Ford. Since then it has been renamed and circulated in organisations to improve the managerial structures.
- The furthermost criticism faced by BPR is with regards to its undue stress on concerns the strict focus on effectiveness and technical expertise. The process completely disregards the role of individuals in the success of organisations. For this reason, BPR was frequently used as a tool to reduce workforce of an organisation. Thomas Davenport, an initial supporter of BPR process has commented that: "When I wrote about "business process redesign" in 1990, I explicitly said that using it for cost reduction alone was not a sensible goal". According to pioneering consultants of BPR, Michael Hammer and James Champy, downsizing was not the agenda for implementing reengineering. Hammer realised the importance of human aspect in the organisation and acknowledged that: "I wasn't smart enough about that. I was reflecting my

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15. What do you mean by value engineering?
16. List the numerous stages of value engineering.

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engineering background and was insufficient appreciative of the human dimension. I've learned that's critical."

- BPR was very often considered as a method of improving existing processes by making minor changes. But actually what was needed was that a drastic approach should have been adopted to justify the prevailing practices. BPR was frequently supposed as a sole, one time application for reducing costs. In actuality, its primary aim is not to function as a tool for cost efficiency as that is an outcome of successful implementation of the process. BPR is a continuous process. All these misunderstandings frequently create resentment among the staff and consider its success to be a threat to their jobs. BPR needs an extensive and enduring support from the top management and workers. Obtaining such a long-term commitment is not simple and because of such expectations several businesses have rejected the process and refuse to make effort in its implementation. In several circumstances corporate practices are reformatted as they are just programmed.
- In few instances, the competence of a single unit was developed at the cost of the entire process. For BPR to be implemented completely and effectively, there is a need to develop the processes of all the units of the organisation and focus on integrating each one of them. The process of BPR tries to eliminate the prevailing processes in order to create fresh systems. It has been criticised by many for completely doing away with existing processes.
- The companies get so involved in changing their internal systems that they completely lose track of the activities outside the company and this leads to failure in keeping up with the competition in the market.
- In order to overcome the criticism, the companies are looking at BPR as 'business process redesign' instead of reengineering as they feel that in the attempt to bring about changes, the existing processes need to be restyled and not replaced.
- BPR begins with a vision or notion. The vision in most cases is sourced from solutions of other companies. The process mostly follows the method of benchmarking in order to find solutions. The solution provided using this method may not match the requirements of the product which is sold by a particular company. There is a need to develop tailor-made solutions for each organisation. Benchmarking fails to permit advantageous position for facing competition. Benchmarking leads to eliminating the existing processes as the solutions do not fit into the existing system. This method is often criticised as it mostly leads to reducing the work force.
- Approach of BPR is only focused on reconsidering the existing system or processes, and giving new suggestion, the approach does not help in nourishing the existing system so that productivity can increase. The approach is often criticised as introducing new process prevents the management to spontaneously deal with external pressures. BPR is extremely focused on changing the work processes in a radical manner. This change not only changes the organisational structure but at the same time changes the work culture as well.

4.10 BPR CAN DO WELL

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BPR has the potential to affect the working of the entire business and the manner in which the organisation functions. The implementation of BPR in an organisation can help the business to flourish or collapse. All this depends on the successful implementation of BPR.

Factors for the successful implementation BPR have been discussed in detail in the previous section of this unit. The BPR functions have to be supported by an effective team which should be composed of experts who carry adequate experience, adequate analysation of the requirements of the business by the team, strong IT infrastructure Business should be adaptable to change and it should be supported from top management till the lowest level of workers. BPR is a non-stop process so that continuous enhancement can take place. The efforts of BPR will be worthwhile only if there are modifications in the structure of the organisation. The employees are supportive and responsible towards the efforts.

The rate of failure of BPR initiative may be reduced if the efforts are focused on improving quality, providing customer service, meeting the demands of the market, diminutions in expenses and time of delivery.

4.10.1 Steps to Increase the Rate of BPR Success

The BPR can do better if following steps are taken:

- Need to optimize all the departments and not focus on a single unit at the cost of others.
- The changes should be introduced slowly by giving time for the process to improve.
- Understanding the magnitude and scope of the issue
- Handling of BPR efforts by an experienced team and providing complete training to workers about the process.
- Adequate investment for providing resources needed for the process.
- Provision of adequate infrastructure
- Doing away with excessive administrative processes
- Motivating the personnel of the organisation
- Encouraging team work and cooperation among the workers

Several failed BPR efforts might have taken place because of the misperception which surrounds the process and the methodology of the process. In most cases, the organisation is unaware about the areas where changes are needed due to this reengineering becomes a process of trails and errors. The practical experiments, sometimes, produce the desired results and occasionally, fail to be a success. The process is gaining strength and experience due to the trial and error methods. In order to benefit from the process in the long run, the businesses need to have a clear understanding of their corporate strategies and then they can benefit from the reengineering efforts in cost effectiveness, time cycles and productivity. Or else, BPR will remain a temporary efficiency implementation.

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The process can do better only if there is commitment from the entire organisations. The alteration of business processes is bound to bring changes in technical know-how, job responsibilities, work culture, etc. The changes are going to affect the resources and leadership strictures of the organisation. These changes should be introduced gradually as sudden changes are bound to result in disharmony of personnel as well as resources.

Implementation of reengineering entails the abilities and dynamism of a wide-range of specialists. As BPR may encompass several parts in the organization. It is essential to acquire backing from all departments which may be affected directly or indirectly. There has to be contribution from all sections of organisation so that input of various individuals can be incorporated into the process. The involvement of employees during implementation will lead to easy acceptance of the processes.

Management has to be operative, robust, evident, and imaginative in rationale and empathetic so that they can provide guidance and clarity of the vision. They need to be able to convince all groups in the organisation about the importance of implementing BPR process. The management has to keep people down the line completely informed and stress on the positive aspects of the reengineering process. BPR will be able to do better if strong, constant and nonstop participation of all the departments is secured during the implementation of the process.

Just by implementing the process, a business is not going to be successful. There has to be complete recognition of importance of human resources in the organisation and success will not take place by just introducing advance technology and redesigning the processes.

4.10.2 The Path Towards Betterment

It is very essential to realise that BPR is an ongoing, unremitting and enhancement process. All organisations, which have implemented the process incorporating this feature, have attained success. BPR should be considered as a strategy which is purely focused on improving the organisation's traditional functions. It should try to align the current processes with the existing structures and processes.

Non-stop enhancement should be the tendency of the organization to follow augmented and innovative improvements in its practices, products, and services. The augmented change is administered by the awareness expanded due to the prior changes. It is vital that the computerisation infrastructure of the BPR efforts delivers scope for measuring performance so that further improvements can take place. The data has to be monitored and collected correctly so that it can be handed over to the relevant staff. To guarantee desired benefits as the outcome of the process, each process should be tried and tested prior to implementation. The tested processes can be modified to suit the needs of the organisation. The applied processes should be followed up regularly and there should be provision for providing feedback for the same. Constant assessment will not only give opportunity for the individuals to improve, but at the same time, it will allow improvement of the process as well. The final consumer should also have the provision to give feedback about the product or the service. This will help in resolving future problems.

Forestalling and preparation for handling risk is essential for being able to rectify risk and fault at initial stages. It is fascinating to realise that most of the companies,

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which have implemented reengineering process successfully, have defined it as a practice which is continuous, as the process continues to improve the programs of the businesses in which it has been implemented. Hammer and Champy have mentioned the IBM Credit Corporation, Ford and Kodak, as examples of businesses which have implemented BPR successfully because these companies considered BPR as a long-term constant enhancement program.

Effective BPR can actually generate significant enhancements in the manner the organisation functions and provide success to its various business undertakings. Nevertheless, the success will be attained only if the factors responsible for smooth functioning of BPR are followed. The eventual accomplishment of BPR rests on the individuals and their commitment level. These individuals have to have complete knowledge about the implementation of the BPR process. Organizations preparing to start BPR need to take into account the factors responsible for success of BPR and make sure that they closely study the organisations which have successfully implemented BPR processes into their organisation.

4.11 SUMMARY

- There are several factors which were found to be critical to BPR implementation success. The factors are teamwork and quality culture, quality management system and satisfactory rewards, effective change management, information technology/information system, effective project management, etc.
- In many circumstances, reengineering has not always lived up to its expectations. Due to the confusion surrounding BPR, and how it should be performed, many unsuccessful BPR attempts may have been made.
- To reap lasting benefits, companies must be willing to examine how strategy and reengineering complement each other by learning to quantify strategy by accepting ownership of the strategy throughout the organization, by assessing the organization's current capabilities and process realistically, and by linking strategy to the budgeting process.
- In order to attain reengineering success, it is essential to introduce new processes in the workplace so that people are encouraged to work. By means of BPR, different jobs are created and prevailing reward systems are not adequate. Hence, there is a need to revise the system of rewards so that the BPR efforts are productive.
- Educating and training people is very essential element of effectual implementation of BPR. Researchers feel that in order to implement BPR successfully, the companies should make their staff members participate in several programmes so that they are adequately educated about the process.
- Support and encouragement during change helps the individuals to push themselves so that they are able to overcome the barriers. The top management plays a crucial role in persuading them to welcome change.
- Incorporating other improved approaches with the BPR is bound to successfully implement the process. According to many researchers, applying various continuous improvement techniques such as TQM or CQI along with BPR is are useful during the reengineering process.

Check Your Progress

17. Why have some BPR efforts not succeeded?
18. What steps are needed to stave off the rate of BPR failure?

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- Hammer and Champy have tried to stress on four essential elements of reengineering which give it a revolution like status: fundamental, radical, dramatic, and process. In this, process is explained by them as, “a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer.”
- Total Quality Management (TQM) and business process reengineering (BPR) are related concepts as both are based on cross-functional relationships. In order to clearly understand these two concepts, the difference between them has to be understood.
- The association between continuous quality improvement and business process reengineering has always been a topic which has attracted numerous debates. The two approaches are different yet similar in few aspects. They both work towards improving the systems of the organisation but while doing this task, their focuses are on different aspects of the system.
- Scientific management can be understood as the theory of management that applies science in order to analyse and create workflows so that efficiency can be enhanced and the human as well as capital resources of the organisation can be utilised completely to increase productivity.
- The principles and techniques of engineering design are used to identify, forecast, and assess the outcomes which have to be attained from the systems or processes of the organisation.
- Value engineering or value analysis is a structured methodology that helps in identifying superfluous costs attached to the product, process or service. It helps in engineering the economic worth of the product or the process.
- Eliyahu M. Goldratt has commented in his ‘Theory of Constraints’ that reengineering is unable to deliver a useful method to concentrate enhancement efforts on the organization’s constraint.
- The rate of failure of BPR initiative may be reduced if the efforts are focused on improving quality, providing customer service, meeting the demands of the market, diminutions in expenses and time of delivery.

4.12 ANSWERS TO ‘CHECK YOUR PROGRESS’

1. According to the research undertaken by Michael Hammer (1990), and Davenport and Short (1990), several organisations have considerably benefited due to the implementation of Business Process Re-engineering (BPR). Some of the companies which have successfully implemented BPR are: Ford Motor Co., CIGNA, and Wal-Mart.
2. The main factors of BPR success are: teamwork and quality culture, quality management system and satisfactory rewards, effective change management, information technology/information system, effective project management, etc.
3. In order to attain reengineering success, it is essential to introduce new processes in the workplace so that people are encouraged to work. By means of BPR, different jobs are created and prevailing reward systems are not adequate.

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Constructing a culture which leads to successful implementation of BPR in the organisation.

4. Dedicated and resilient direction and leadership from the top management is an essential factor for BPR projects to be effective in the organisation. Leadership and direction has to be active, sturdy, evident, innovative and considerate so that the workers are able to be guided with clarity about future goals. The vision of the leader has to be interpreted well across the various levels of employees. The senior management has to be supportive and committed from the beginning till the end of the implementation of the BPR projects. The leader has to deal with organisational resistance during the implementation process in a very understanding as well as authoritative manner.
5. Constructing an operative IT infrastructure has been considered as an important factor by several researchers. There is a need for sufficient IT infrastructure re-evaluation and structure. Adequate understanding and identification of enabling technologies for redesigning business processes, appropriate assortment of IT platforms, building of an efficient overall system, adjustable and supple IT infrastructure, and accurate setting up of IT mechanisms these are essential aspects for a strong IT infrastructure which can support business processes.
6. In the early 1990s, at the outset of the reengineering revolution, Dr. Michael Hammer familiarised the concept of reengineering revolution with the help of his article which was published in the Harvard Business Review under the title of, Reengineering Work: Don't Automate, Obliterate. Through his article, he demands the businesses to reengineer by means of "the power of modern information technology to radically redesign our business processes to achieve dramatic improvements in their performance." Later, Dr. Hammer and Champy wrote their important book, "Reengineering the Corporation: A Manifesto for Business Revolution". With the help of this book, the authors asserted "that "information technology acts as an essential enabler to reengineer, and that without information technology, the process could not be reengineered."
7. The companies face enormous challenges in current set up due to unsettling technologies. These technologies alter the environment and construct ambiguity and risks. In order to sustain in this ambiguous environment, competitive companies try to work out avenues which will help in reducing risks and increase the opportunities which will help in maintaining lucrativeness and competitive advantage. Reengineering processes demand from the managers that they must specify objectives which are ambitious and require new business processes. To accomplish this, managers may choose the various corporate strategies such as reengineering.
8. Total Quality Management focuses on increasing productivity by improving the quality whereas BPR focuses on improving the processes so that there is enhancement of productivity. The improvements in the process are done by redesigning the existing processes and introducing latest technical know-how. The aim of both the concepts is to enhance the organisational efficiency.
9. The objectives of Total Quality Management (TQM) are based on the following principles:

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- Need to produce quality yield from the beginning
- Stresses on fulfilling the expectations of the consumers
- All strategies are aimed for non-stop enhancements
- Inspiring reciprocal reverence and co-operation

10. Continuous Quality Improvement (CQI) endorses the necessity for objective information in order to evaluate and enhance the processes. As a management philosophy, CQI argues that all processes can be enriched. The philosophy is based on principles of scientific methods and tries to bring improvements by means of undertaking experiments. The method is applicable to most routine activities of an organisation so that they can be improved and the consumers can be served better.
11. The Principal concepts of CQI are:
    - Quality is determined by providing the needs of the customer or better than their anticipations.
    - Achieving success means to fulfil the requirements of those who are served by the organisation.
    - People working in the process are not at fault, it is the process which needs to be improved in case results are not achieved.
    - Unintentional alterations in processes will result in changing the outcome. Hence unintentional alterations should be completely avoided.
    - There is a possibility to attain constant enhancement with the help of minor changes when methods are scientifically applied.
    - Constant enhancement is extremely useful as it allows functioning in a normal routine.
12. Frederick Winslow Taylor and his confidants were the pioneers to research the work processes in a scientific manner. They deliberated on the procedures involved while performing work, and its impact on the efficiency of the workers. Taylor believed that the method and effectiveness of the task was more important than the amount of labour which was incurred while performing the task. He published 'The Principles of Scientific Management' in 1909 in this he suggested that through improving and streamlining jobs, efficiency will definitely increase. He further suggested that there should be high level of cooperation between the staff members and the managers.

    On the basis of his studies and experiments, Taylor outlined four principles of scientific management. These principles are sometimes referred to as "Taylorism".
13. The branch of engineering which works towards optimizing multifaceted processes, systems, or organizations is referred as industrial engineering. The task of industrial engineers is to engineer methods which will help in optimum utilisation of time, capital, resources, work-hours, machine time, and power. They also work in eradicating resources which are not useful for the processes of the organisation. With the help of industrial engineering, processes and systems are created which help in improving quality and efficiency.

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14. Some of the principles of Industrial Engineering are:
    - Enhancement of work methods
    - Developing work standards
    - Improvements in work efficiency
    - Reducing time taken to perform a task
15. Value engineering or value analysis is a structured methodology that helps in identifying superfluous costs attached to the product, process or service. It helps in engineering the economic worth of the product or the process. The tool of value engineering is used in businesses to help in eliminating unwanted actions and steps which do not have an impact on the efficiency of the process and maintaining quality and reliability of the process.
16. The exercise of value engineering consists of the following stages:
    - Commencing
    - Familiarisation
    - Invention
    - Appraisal
    - Selection
    - Implementation
    - Progress
17. Several failed BPR efforts might have taken place because of the misperception which surrounds the process and the methodology of the process. In most cases, the organisation is unaware about the areas where changes are needed due to this reengineering becomes a process of trails and errors. The practical experiments, sometimes, produce the desired results and occasionally, fail to be a success. The process is gaining strength and experience due to the trial and error methods.
18. The BPR can do better if following steps are taken:
    - Need to optimize all the departments and not focus on a single unit at the cost of others.
    - The changes should be introduced slowly by giving time for the process to improve.
    - Understanding the magnitude and scope of the issue
    - Handling of BPR efforts by an experienced team and providing complete training to workers about the process.
    - Adequate investment for providing resources needed for the process.
    - Provision of adequate infrastructure
    - Doing away with excessive administrative processes
    - Motivating the personnel of the organisation
    - Encouraging team work and cooperation among the workers

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4.13 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate the various factors of BPR success.
2. Write a brief note on the need for reengineering revolution in current situation.
3. State the difference between TQM and BPR.
4. Enumerate the role of Continuous Quality Improvement (CQI) for the BPR success.
5. Write a short note on the benefits of integrating BPR and Scientific Management.
6. Enumerate industrial engineering and its principles.
7. Elaborate the advantages of value engineering for the BPR success.
8. State some of the explanations for the criticism of BPR.

Long-Answer Questions

1. Discuss how change in the work culture and continuous communication help in the implementation of BPR efforts
2. Enumerate the role of effective project management for BPR success.
3. Elaborate the important role played by IT infrastructure to promote the reengineering efforts.
4. Write a comprehensive note on the contribution of Dr Michael Hammer in familiarising the concept of reengineering revolution to the world of business.
5. Analyse the significant role of Total Quality Management (TQM) for BPR success.
6. Discuss the various factors for effective workflows with CQI.
7. Elaborate the significance and critiques of scientific management in the reengineering efforts.
8. Discuss the various steps which companies need to take to bring in more BPR successes.

UNIT 5 TYPES OF FUNCTIONAL FLEXI SYSTEMS

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Structure

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5.0 INTRODUCTION

Flexibility, in the most common way, is defined as, 'able to change or be changed easily according to the situation.' It is the ability to adapt easily to different scenarios. In our fast-paced world, it is becoming more and more important for businesses to ensure that they are as flexible as possible in every area of their work. However, the main focus is to find out how exactly can this be applied to modern business?

In a business context, flexibility can refer to a number of different ideas. Today it's most common usage is in the workplace where it refers to such things as flexi-time, variable hours and extended periods of leave. But the word has a longer pedigree in the area of strategy, where it generally refers to a firm's ability to respond to changes in its environment both rapidly and at low cost. A firm's strategic flexibility depends on its organisational structure, on the way in which its various units work with each other,

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and the freedom they have to take decisions on their own initiative. In the 21st century companies have come to value flexibility more and more, and have looked for ways in which they could transform the company.

Rapid technological and economic changes mean flexible organizations enjoy an advantage over companies that are stuck in their ways. A flexible company is willing to try new approaches, even when the old ways are working fine. Continuously refining the company's policies helps it identify new and better ways of getting things done and fostering innovation. Over time, its organizational structure becomes more efficient, meaning higher profits and lower costs.

There are several types of flexibility that companies may need to embrace while expanding or consolidating their businesses. The term is often associated in varied degree with different branches of the companies such as finance, marketing, human resources, information system, manufacturing system and supply chain. It could be organizational or strategic

This unit brings in a comprehensive overview of functional flexi systems and discusses in detail about the various types of flexibility.

5.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Understand the different types of functional flexi systems
- Explain the key metrics of flexibility and enterprise flexibility
- Analyse strategic and organizational flexibility
- Understand the role of change management and communication
- Analyse reengineering reporting and system thinking
- Understand the human resources and information system flexibility
- Understand manufacturing systems and supply chain flexibility

5.2 TYPES OF FUNCTIONAL FLEXI SYSTEMS: SIMPLIFYING SYSTEMS

Flexibility has been a topic of research for several business and organisational studies. The studies have resulted in realising that flexibility has to be applied in numerous aspects of organisational processes and cannot be limited to just information systems. Flexibility is considered to be an essential element for the success of any organisation. Flexibility has essentially two dimensions, namely structural and process flexibility. Structural flexibility represents the features of information systems towards transformation or uniformity. Process flexibility is referred to as the capability of organizations to modify information systems to fresh circumstances. This comprises of the skills which are important for reworking aspects concerning programming, changes in management or management of actions.

5.2.1 Flexibility Metrics

Golden and Powell have classified flexibility into four key metrics. These are:

- Competence
- Receptiveness
- Adaptability
- Vigour

Competence may be interpreted as the capability to curtail dilapidation of system performance till a certain extent. Receptiveness is associated with the time-based element. Degree of receptiveness towards change is crucial for an organisation to be flexible. According to experts such as Das and Elango, responsiveness is to be fast and swift in the actions so that various opportunities can be explored and the risk involved in them can be examined concurrently. Adaptability processes the magnitude till the organisation is equipped for making changes according to the situations. Vigour processes the ability of a system to respond towards the sudden and unanticipated changes in the business environment.

5.3 ENTERPRISE FLEXIBILITY: READY FOR EXPERIMENTING AND COPING WITH PARADOXES

The environment of international business demands that there should be an increase in the number of innovations. The number of innovations can increase only if the enterprise is flexible. The enterprises need to have the ability to manage innovations and flexibility at the same time. Unchanging processes will lead to regular outcomes. The businesses, which are able to generate, regulate, transform and quantify processes with suppleness and effortlessness, and adapt these changed processes across their corporate settings effortlessly and proficiently, are bound to survive the competition in the market as they will be able to anticipate the demand and supply according to the market trends. The companies have to adapt themselves to the changing environment of the international markets. The world is turning into a global village and numerous underdeveloped economies are liberalising their economic policies in order to adjust to the changing global environment. The most flexible will be able to survive the global competition.

5.3.1 Definition, Functional Features and Scope of Enterprise Flexibility

Enterprise flexibility is defined in many ways. According to Carlsson, enterprise flexibility may be explained in three areas. These are as follows:

- The qualities of productions techniques which are able to adapt in order to increase production.
- The firm's ability to respond to ambiguity, particularly in regards to alterations in demand and market failures.
- Property to alter the costs as per the market positions.

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Check Your Progress

1. What do you understand by flexibility?
2. What are the four key metrics of flexibility as described by Golden and Powell?

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Nilsson and Nordahl have defined enterprise flexibility as the flexibility of an enterprise in adequately responding to shifting situations. Upton explains flexibility as the capability to make quick adjustments without wasting time, effort, cost or performance. Benjaafar and Ramakrishnan have defined flexibility as the capability of a system to adopt diverse positions. Wadhwa and Rao have explained flexibility as the skill to handle change by thoughtfully planning and using manageable possibilities vigorously. Flexibility is the capability to react to environmental or structural changes internally as well as externally.

According to Professor Sushil at Indian Institute of Technology Delhi, the concept is defined as flexibility to react accordingly so that best solution can be worked out to save labour and time. Centred on this perception, Sushil suggested a SAP-LAP model to help the process of analysis and idea generation. Sushil outlines enterprise flexibility as constructing alternatives at different levels in the enterprise, evolving methods and means of change through the variety of alternatives, and enabling autonomy of choice to different performers in the enterprise to create change with least amount of labour and duration. Enterprise flexibility has been defined by various authors yet a concrete definition is missing as the concept has a very broad meaning. Flexibility is the means which helps the enterprises to evade ambiguity in a rapidly shifting atmosphere. The organisational processes, systems and presentations should be able to effortlessly adjust to variations without incurring expenses and lengthy infrastructural refurbishments. The top management of the organisation should be completely aware about the expanse of business flexibility. Though, the concept of flexibility has been interpreted in many ways in business world according to Asian Labour Update Issue, wages as per performance is an additional aspect of flexibility.

Enterprise flexibility: Flexibility can be thought of as an ability of the enterprise to quickly and efficiently respond to market changes and to bring new products and services quickly to the market place.

Enterprise flexibility largely contains functional features like research and development, technical alterations and administrative change, invention and venture, alterations and flexibility in the working and internal training of new and old employees. It stresses on managing human resources so that profit margins increase and employees perform in an efficient manner. The flexibility in organisation helps in giving a competitive advantage to the enterprise. According to Raymond and Bruce, enterprise flexibility is required in all the resources, which is are not limited to materials and machine apparatuses. These resources are people, structure of the organization, the flow of information, ethos and processes of decision-making. Moreover, a resource which has flexibility is more useful as it helps in overcoming the shortcomings of the other resources and acts as an alternative. In broader terms, resource can be described as the concrete or impalpable tools with the organisation which are used for attaining success. Some apparent instances of resources comprise factory and apparatus, raw materials, personnel and monetary assets.

5.3.2 Necessity for Change: Shift in the Business Model

Handling flexibility has become a requisite for the upcoming business systems. Companies want flexible enterprise presentations which can be adapted swiftly in order to maintain competitive processes of the company and it should be able to easily adjust to present day's vigorous business environment. For this challenge to be met, a fresh level of enterprise application flexibility is necessary. The fresh level of enterprise flexibility will be possible by improving software compliance so that the companies are able to construct economical applications which are able to back the intricate business processes

and practices. These practices are able to deliver distinguished product and service which appeal to the consumers. The fresh applications are able to reduce the process cycle, prompt reaction to consumers, increase the profit margins which result in increasing the value for the stakeholders. Further benefits of more software flexibility enable the company to reduce the time-cycle and help in employing only the essential IT resources. This helps in saving funds and judicial use of resources. The business model based on flexibility is going to be established in the future and there are many fresh management approaches like BPR, TQM, Supply Chain Management, Business Process Management (BPM), Business Intelligence (BI), and E-Commerce being adopted by businesses in order to bring changes and flexibility in their systems. A lot of present day businesses have now progressed from being firms with single application approaches to extra flexible business focused solutions.

According to Kanter (1997), CEO Good Measure Inc., following shifts are prominent in the organization's functional processes and these have noteworthy implications on human resources of the company. Here are four functional areas for flexibility in enterprise. These are:

- Fresh staffing principles are focused on lean rather than fat as it makes the organization more bendable and cost effective.
- Shift from homogeneousness to multiplicity. The new workforce has females and individuals belonging to minority groups attaining prominent positions in the company. This was not seen earlier.
- Power is in the hands of individuals who are experts in professional knowledge and can establish better relationships with the staff, and it is no longer based on hierarchies of formal authority.
- The new organisations function in cross departmental teams. There are vertical to horizontal work teams.

According to Lake (2006), some of the flexi practices are:

1. **Knowledge management (KM):** This consist of a variety of practices utilised by organizations to recognize, construct, signify and allocate knowledge for reuse, consciousness and education and is usually intended to achieve aims and the objectives of the organisation such as collective intellect, enhanced performance, competitive benefit or greater heights of improvement. Infosys Technologies Limited, Ashok Leyland, Oracle Corporation, IBM Corporation, Tata Consultancy Services, Tata Steel, Maruti Udyog Limited, and World Bank are some of the organisations which have effectively implemented KM and the benefits of this practice are visible in the services provided by these organisations.
2. **Multi-skilled practice:** Improving the specialized accomplishments of the employees helps in utilisation of staff in multiple roles. This practice is not only beneficial for the organisation but at the same time helps in enhancing the skills and proficiency of the employees. The employees are able to increase the scope of their employability. The organisation is able to save funds which are spent on providing better services for the consumers.
3. **Hot-desking:** This practice is an outcome of shifting business model and a step towards flexibility of the enterprise. Here, the employees frequently change their work-space in the office. Sometimes hot-desking is synonym for virtual

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workplace. With the advancement in electronic networks employees can work from wherever they are. The tele-collaboration has helped the enterprises to popularise Instant Messaging (IM) even more than e-mail or voice-mail. The practice of Instant Messaging is being used by companies like IBM, Microsoft, Hewlett Packard (HP), and Hindustan Lever Limited (HLL).

4. **Business process management (BPM):** This practice works towards enhancing the routine operations, systems and methods of the business. The implementation of BPM is beneficial for the organisations as it helps in economising all facets of a business, monitoring the prevailing applications and processes.
5. **Business intelligence (BI):** The practice is presently being used by the companies so that the effective ERP (enterprise resource planning) can take place which will help in improving the return on investment (ROI). Brands like Shopper's Stop practice its BI podium for Customer Relationship Management (CRM) exploration and operational performance study for few of its retail products.
6. **Electronic commerce (E-commerce):** Successful businesses all over the world are using this technology. Broadband is becoming ever-present; Wireless Fidelity (wi- fi) is an implanted technology of wireless area networks (WAN), every individual has a mobile phone and can excess their e-mails instantly. Advancement in the form of Bluetooth, Third Generation (3G) cell phone networks and Voice over Internet Protocol (VoIP) has helped in enhancing the availability of information in any part of the world.

5.3.3 Advantages of Enterprise Flexibility

There are numerous advantages of flexibility. These are as follows:

- Better and greater amount of pellucidity
- Prompt data distribution
- Improved managerial competence, relaxed approachability
- Improved quality of information
- Increased extent of knowledge
- Educating the value of service
- Swift management of time
- Better equipped for innovation
- Achieving growth prospects
- Emphasis on outcomes and constructing value
- Decreasing the cost
- It helps in making a place in global market
- Amplified output
- Consumer focussed quality
- Enhanced product and service performance

- Appreciating staff and associates
- Better employee morale and greater job satisfaction
- It helps in retaining experienced and capable employees
- It reduces the amount of paperwork and often results in cutting down the office expenses
- It provides better work environment

Nowadays, prosperous businesses are looking for fresh benefits in the market with the help of business processes and technologies so that they are able to handle competition. Nonetheless, many businesses are stressed and struggling because of lack of required degree of dexterity and are unable to react promptly and take advantage of the available business openings. Lack of flexibility in the running of companies prevents the managers to solve problems emerging during the routine functioning. The rigid and the traditional approaches have to be replaced with the present day management solutions so that the business is able to keep pace with the current market and be equipped for future challenges. Therefore, organizations need to bring in verified, safe and measurable technologies with the innovative approaches which are viable and flexible enterprise applications.

5.4 STRATEGIC FLEXIBILITY: READY FOR CHANGE AND DYNAMICS

A firm's competence to adjust its working according to the external environment may be referred to as strategic flexibility. The organization needs to recognise the changes in the environment and rapidly alter and allocate resources to handle and control the changes. The company should recognise the causes for the change so that it can rectify and revert back to its original operations once the environment is stable and restored to its original state. The concept of strategic flexibility is two sided as the adjustments have to be made before and after the event. Strategic flexibility is a quality which all contemporary organizations need to possess so that they can make alterations to cater to unanticipated events in the external environment.

5.4.1 Definition and Forms of Strategic Flexibility

Raynor has called it an interaction of several components containing: arrangements made based on systematic readings, which investigate possibility of various situations; construction of strategies for every situation; procurement of resources and talents which will be required to implement the strategies; application of the most feasible strategy; and being prepared to shift towards applying new strategy in case there is need. Aaker and Mascarenhas have defined strategic flexibility as the "ability of the organization to adapt to substantial, uncertain and fast occurring (relative to the required reaction time) environmental changes that have a meaningful impact on the organization's performance". According to Upton, companies are strategically flexible if they are able to shift their functioning into a different line of business, without bothering if the new line is completely diverse from the existing business.

Check Your Progress

3. Define enterprise flexibility. What functional features does it carry?
4. List some of the flexi practices.

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Forms of Strategic Flexibility

Four forms of strategic flexibility are:

- The time to react to the alteration in external environment
- The assortment of possibilities existing
- The perception
- The focus area of the flexibility produced

Example of a company's strategic flexibility will be visible in situations such as drop in profit margins or entrance of a fresh participant in the market who will be offering an improved product. These situations will bring a change in the external environment. In order to deal with these changes, the organisation may require to readdress their resources to different operations like R&D, sales force, etc. so that it is able to retain its present spot in the market.

Steps to Attain Strategic Flexibility

The company's success is largely dependent on its strategic planning process. There should be well defined future plans, schemes, future objectives and ways of achieving the objectives.

The course of the strategic planning is as follows:

Recognising the undertaking and revelation of the company

↓

Establishing the objectives

↓

Present state of affairs investigation

↓

Devising the strategy for attaining the agreed objectives

↓

Appropriate application of the agreed strategies

↓

Feedback and filling of gaps

Strategic management process of a company is its rational methodology to carry out the business. Top management needs to implement a well thought out strategies of the company as it is going to be the foundation of the present and future business operations.

> **Strategic flexibility:** It is the organization's capability to identify major changes in the external environment, quickly commit resources to new courses of action in response to those changes, and recognize and act promptly when it is time to halt or reverse existing resource commitments.

Advantages of Strategic Flexibility

Strategic flexibility enables firms many advantages. These are as follows:

- Strategic flexibility helps in sustaining growth. The modern firms cannot just relay on traditional ways of handling competition in the market. The current market situations compel the owners to react quickly to the changes in the external environment to be able to survive the competition.

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- The companies are able to focus on enhancing their business as they can handle the changes in the market.
- The industrialists incessantly peruse the surroundings for extra opportunities as they are equipped to avail the new options.
- The businesses are able to satisfy the customers better and understand the 'pulse' of the market.
- Flexibility increases the interaction of the top management with the employees. Frequent interaction helps in free flow of ideas and apprehensions.
- Strategically flexible companies are able to sustain low and adjustable overheads in comparison to the firms which have made long-term investments. Businesses which have rigid cost structures are not able to alter their strategies according to the changes in the external environment.
- Traditional firms have limitations as their structures are resolutely rooted. As a result, they lack strategic flexibility. Such organizational structures are difficult to change as the employees are not interested and welcoming towards changes. Modern firm's employees have a more descriptive job profile and are able to function in environment which is not very structured. Such firms are able to get their employees to adapt quickly to the changes in the market and react accordingly.
- Companies with strategic flexibility have less number of decision-makers. The decisions are made and promptly implemented so that adjustments can be made to handle changes in the external environment.

5.5 ORGANISATIONAL FLEXIBILITY: FLUIDITY AND MANAGING BY WALKING AROUND

Flexibility in organization of human resources may be defined as organisational flexibility. Normally, organisational flexibility is all about what time it takes to get work done, where it gets done and by what method work gets done. Organisational flexibility comprises the following aspects of functional areas in an organization:

- Ensuring flex timings which give the employee the freedom to choose the time they begin and finish their day.
- The employees may be allowed to take a break during their working hours to deal with some family or personal commitment.
- Being allowed to take payed holiday to attend to family matters.
- An employee may be allowed to work from home for few hours or an entire day.
- To be able to choose the working shift an employee is comfortable to work. Some employees are reluctant to work in a night shift; they should be allotted the shifts according to their preference.
- It permits the employees to work extra hours on certain days so that they can take time off according to their requirements.

Check Your Progress

5. Define strategic flexibility.
6. What are the four forms of strategic flexibility?
7. List some advantages of strategic flexibility.

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Organisational flexibility is very essential in current changing environment. The organisation needs to have a work force which is able to handle the changes. Today rapid changes are taking place in every aspect of life whether it is social, technical, economical, legal and political within the country and abroad. The organisations need to be flexible to be able to adapt to changes in all these aspects. The workplace and the workforce have to be flexible.

5.5.1 Types of Organisational Flexibility

Organizational flexibility are classified into several categories. These are as follows:

1. **Functional flexibility:** The employees have to be flexible in doing various jobs allotted to them besides their job profile. The organisations want employees who are skilled at performing multiple jobs.
2. **Numerical flexibility:** The organisation has the flexibility of employing extra labour as per the requirement of the job and is at liberty to removing them when the job is complete. The organisation can decide on the number of employees it wishes to hire for their operations.
3. **Financial flexibility**: It is about an enterprise's capability to respond to unforeseen overheads and investment opportunities.
4. **Procedural flexibility**: The organisation is able to decide its methods to carry out its processes and systems.
5. **Skills flexibility**: According to Robert Shea, "individuals who cultivate a variety of skills seem brighter, more energetic and more adaptable than those who know how to do one thing only". Workplace environment is changing all the time, the employees will have to be able to change quickly according to the role and responsibilities allotted to them. They need to be able to skilfully multi-task and react to the changing settings. They should be able to handle unanticipated issues and meet the new deadlines.
6. **Attitudinal flexibility**: The employees have to perform all their activities with a positive attitude. The flexibility in their attitude is very essential to handle the unexpected changes.
7. **Structural flexibility**: The organisation should allow workers to take decisions about the minor hurdles they face while performing their routine tasks. The top management should involve the staff while taking decisions as they might give a very practical viewpoint of the task.

5.5.2 Advantages of Organisational Flexibility

In present environment, businesses need to be flexible if they wish to succeed. The organisations need to be flexible so that they can easily adapt the advancement in the technology and deal with the economic changes. The businesses must promote organisational flexibility by boosting their workforce to discover fresh and improved methods of performing tasks and should replace the ineffective policies with new flexible practices.

There are many advantages of organisational flexibility. These are as follows:

- Providing flexibility in working hours is bound to increase employee morale. Thus, they are contented and satisfied.
- Contented and happy employees are motivated to work efficiently. Organisational flexibility helps in improving productivity.
- The flexi hours give the employees an opportunity to attend to their personal matters. Hence they are not absent from work.
- Organisational flexibility helps in reducing the rate of attrition.
- Organisations which allow employees to function with flexibility often attract finest and skilled employees.
- The organisation with flexibility saves funds as they incur fewer expenses on electricity, furniture and office space.
- Organisational flexibility enhances the brand name and popularity. The company owners are known in the corporate sector for their just behaviour.
- Organisational flexibility helps the company to handle the competition in the market.
- A flexible company is prepared to attempt innovative approaches, along with the existing practices. This helps in improving the existing structures and processes of the company. In the long run, this is bound to make the organization extra competent, attaining higher profits and costs effective.
- A flexible managing arrangement benefits from the strengths of its staff. A skilled manager is able to create effective team by employing the talents and aptitudes of the staff.

5.6 UNDERSTANDING FINANCIAL FLEXIBILITY

Financial flexibility refers to a company's capability to avail the opportunities created by unanticipated openings or its capability to handle unforeseen happenings due to the firm's financial policies and financial structure. For instance, a company which has high liability, fragile foundations and liquidity cannot exercise financial flexibility. The responsiveness of the company to pay off and sustain external workforce market environments can be termed as the financial flexibility of the company. Businesses with higher financial flexibility are not only able to sustain the rough economic changes but at the same time they are able to benefit from such situations.

The flexibility enables the company to make investments as well. The companies which lack flexibility are incapable of sufficiently responding to unanticipated obstacles as they lack resources and are unable to survive economic depressions. In other words, financial flexibility refers to a company's talent to utilise its financial resources to adjust to change. Financial flexibility mainly encompasses the managing of cash and other resources. Further, it contains the prospective to generate fresh and long-term liabilities, to streamline current debt, and to manage debt in other ways.

The main kinds of existing liabilities are categorized into three groups: (a) existing liabilities requiring a predetermined amount; (b) existing liabilities whose amounts is subjected to operations; and (c) existing liabilities needing amounts that have to be assessed.

Universally acknowledged classifications of financial flexibility contain:

1. **Leverage:** The use of debt to increase the total profits returned to the company's equity holders.

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2. **Cash Holdings**: This includes paper money, coins, checks, money orders, and money on deposit with banks.

The measures of leverage include:

Debt Ratio = Total Liabilities / Total Assets

Debt to Equity = Total Liabilities / Owner's Equity

As the mentioned ratios grow, the risk related with financial needs also grows. Greater ratios might restrict the company's capability to borrow, thus dropping the company's financial flexibility. A company's financial flexibility is its facility to rapidly generate required funds so that the crisis can be resolved.

5.7 MARKETING FLEXIBILITY: AN OVERVIEW

The success of an organisation is largely dependent on its marketing strategy. Kotler has described the importance of marketing by calling it a social process. "Marketing is the social process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others", explains Kotler. Marketing is often confused with selling. Actual marketing is in achieving sustainability by satiating the needs of the customer better than the competitors. The marketing strategy of the organisation will be effective only if it is flexible. Recognizing fluctuations or drifts and being perceptive about the needs of the consumer is an essential part of marketing.

In recent times, marketing has become a very important as the taste and preferences of the customer are constantly varying. Organisations which lack marketing flexibility are unable to cope with the changes in the demands of the users. As a result, there is a sharp decline in their profits and loss of customers. Companies with traditional and rigid marketing plans are finding it hard to survive in the competitive environment. These days, sellers choose to target smaller quantity of profitable customers. Selling goods and services is possible through marketing. The introduction of new product in the market will be successful if it is marketed properly. The toughest task of marketing is to be able to convince the consumers about the usability of the product. The advancement in digital tools for marketing has helped retailer to market and sell their products easily.

5.7.1 Need for Marketing Flexibility

Marketing helps in developing the reputation of the company. The flexibility in the marketing strategy provides scope to the company to instantly react to the feedback of the product. The flexibility allows it to deal with aspects of negative publicity as well.

The success of the product is determined by the consumers. The organisations have to interpret the demands of the customer adequately if they want the product to be a success. Flexibility in marketing allows building a close relation with the consumer. Better customer satisfaction provides greater customer allegiance which leads to improved performance of the company.

Check Your Progress

8. What do you mean by organisational flexibility?
9. List the types of organisational flexibility.
10. What does financial flexibility refer to?

Increased profits and sales are key indicators of the success of the company but they are not the only criteria as these figures can drop without warning. Marketing flexibility provides stability to these figures as the managers of the organisation can respond in time and not lose customers. Organisations identify contented consumers as an extremely treasured asset.

Marketing is an essential tool of an organisation as it is accountable for constructing an organisation's reputation, handling publicity, sale of the products, and generating customer allegiance. Thus the marketing plan is a vital document that corresponds with other strategy planning of the company. Ensuring a flexible marketing plan assists company leaders to develop and monitor anticipations for other functional areas. The company can allocate resources and funds according to the plans. Having flexible marketing strategy helps in taking quick actions without making too many adjustments. The businesses that can swiftly react have a competitive advantage.

Marketing flexibility enables the organisation to react to issues and find solutions and it also helps in taking advantage of the opportunities which are generated due changes in the environment. The organisation needs to be cautious about responding to the problems so that the reputation of the brand is maintained. Constructing a fixed marketing plan and deciding the factors which can alter the plan can help in taking advantage of changing markets.

Fixed Marketing Plan Vs Flexible Marketing Plan

A fixed marketing plan defines the extent of the expenses, mass media engagements, evaluating strategies and channels of distribution and product at the onset. In a fixed marketing plan, the funds are allocated for advertising without considering the amount of sales. Flexible marketing plan starts with a vision about the product and how it is going to be sold and what is the estimated cost and means of promotion. The plan provides flexibility as the advertising fund is decided on the basis of the percentage of the total sales.

Benefits of Fixed Plans and Flexible Plans

A fixed plan enables the organisation to foresee the expenses which are going to be incurred. The plan helps in planning the strategies in advance and helps in constant management of the brand. Flexible marketing plans permit the organisation to rapidly react to changes in the marketplace, avail the new opportunities and solve the issues which rise due to changes. For instance, in case the contender brand drops their prices, the organisation with marketing flexibility will be able to react spontaneously to survive the competition. The organisation can increase or decrease their budget on advertising according to the response of the consumers.

Advantages of Marketing Flexibility

Marketing plans are developed so that the company can market a new product or introduce the brand to fresh consumers.

The flexibility in marketing plan has following advantages:

1. The marketing plan is designed to reach the specific consumers. The consumers can change frequently. Flexible plans help in reaching variety of consumers in various locations.

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2. Flexibility helps in analysing competition and develops strategy to sustain it. The analysis will help in responding to the feedback of the product and enable the organisation to retain its market share.
3. Marketing flexibility helps in forecasting the revenue spent on production as it provides estimated pricing required for certain profit margins, assessment of manufacturing and operational cost. The marketing plan helps in outlining methods of determining the real progress of the plan against the predictions. Flexibility in marketing helps in achieving the final profits which are outlined in the marketing plan.
4. A marketing plan at all times has a determined conclusion. Marketing concepts must continuously change so that they can keep up with the trends of the marketplace. The plans for marketing not only need to be flexible but at the same time they need to be frequently revamped to suit the changing demands of the consumers.

5.8 HUMAN RESOURCE FLEXIBILITY AND ITS RELEVANCE

In present times, the nature of workplace is considered to be highly complexed and impulsive. As a result of globalization, privatization and liberalization, the businesses have become tremendously competitive. In order to survive the competition the companies demand extra energy, skill and multi-tasking from their workforce. As a result, burden of work, fast accomplishment of objectives and targets have become a constant challenge for all individuals. The awareness of human resource flexibility has produced several researches in the field of human resource management since it allows the organization to adjust to varied and altering needs due to the external environment.

The concepts of human resource flexibility in an organization have generated scope for workers to deliberate, sense and perform in such a way that they are able to attain organization's objectives without thinking about the profits of the organizations. Flexibility denotes the competence of an organization to act as per the numerous demands of its environment. Several researchers have recommended HR flexibility as an important organizational competence. Human resource flexibility provides a competitive advantage to the organisation as it enhances the performance levels of the workers. The human resource flexibility is very relevant in the present environment as it is rapidly changing and enforces strategic demands on the organisation. HR flexibility tries to develop the attributes of the workers such as knowledge, skill and behaviour.

Human resource flexibility focuses on the personality and diversity of talents which are possessed by the workers. This could be their skill, performance and wisdom. It indicates the knack to developing, organising and installing human resource system within the setup of the organisation in such a way that the people in the organisation can function to the best of their ability and react to the external environmental changes in an innovative manner. Human resource flexibility has been observed as a competence which assists an organization to adjust to altering environmental emergencies According to Beltran-Martin et al., workers who have the benefit of the flexible work system display better participation in the organisational operations and this helps in increasing the overall performance of the organization

Check Your Progress

11. State the need for marketing flexibility.
12. List the benefits of fixed and flexible plan.

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With the support of human resource flexibility, the performance management system when supported by human resource flexibility not only appreciates the efforts made by the employees but at the same time, the system evolves techniques to enhance the future performance of the employees by providing them opportunity to advance their skills and awareness in upcoming times.

These provisions motivate the employees to have a positive attitude towards their tasks as well as organization. Moreover, this enables the employees to respond with vigour and effectually towards their corresponding responsibilities, eventually achieving success for the organisation. Organisations which provide human resource flexibility systems have a workforce which is more contented with their job in comparison to organizations with less flexibility system.

5.8.1 Scope of Human Resource Flexibility

The scope of human resource flexibility has been divided into three aspects such as employee skill flexibility, employee behaviour flexibility and human resource practice flexibility. According to experts, human resource flexibility influences the financial performance of the organisation in a very positive manner. That is why it is soon being adopted by several companies. There is a close relationship between human resource flexibility and organizational performance because when people in the company work efficiently it is bound to enhance the effectiveness of the organisation and provides a competitive advantage. Another significant reason for the organisation to have competitive advantage is because of organizational citizenship behaviour. Many latest studies have asserted that workers who are keen in organizational citizenship behaviour are daring and dedicated. They put in effort so that the objectives of the organisation can be achieved. They realise that innovative ideas are required for organisation to have a competitive advantage. The concept of organizational citizenship behaviour is closely associated with flexibility in the human resource system.

5.8.2 Aspects of Human Resource Flexibility

There are various aspects of human resource flexibility. These are as follows:

1. **Employee skill flexibility**: This aspect allows the workers to freely use their abilities. It has two features, one is resource flexibility, and the various possible alternates where the skills of the employee can be useful and the other is how people with diverse abilities may be rapidly updated. Employee's resource flexibility refers to the competencies which are possessed by the employees or the additional competencies which are needed to be acquired so that the employee can function efficiently. Besides, skill flexibility defines the effectiveness and the speed at which the employees adapt fresh skills given in the organization. Skill flexibility can be generated by allowing the employees to use their inherent skills when required. This helps in widening the scope of the organisations. The other way of generating skill flexibility is by hiring specialist employees who are able to create skilled workers to encounter altering requirements. According to Neuman & Wright, this flexibility allows the company to restructure its employees as per the required skills of the individuals. An organization could cultivate skill flexibility by practicing job-rotation, creating cross-functional teams, and project-based work appointments. All these will help in generating wide-ranging skill

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formations precisely for the need of the task. Employees with skill flexibility will be able to meet variety of job profiles. They will be able to effectively encounter the desires of the market, consumers and along with that will be able to handle the stress related to work. Skill flexibility will contribute immensely towards creating an effective organisation.

2. **Employee behaviour flexibility:** This helps the workers to adjust to different situations from their routine behaviour. It embodies an easy-going attitude of the employees as opposed to routine conducts and the degree to which employees hold a wide range of behavioural characters which can be adjusted to the specific demands of the situation. Behavioural flexibility is different from skill flexibility. The employees may possess the skills but they may not be behaviourally inclined for the changes and it can be vice-a-versa. Employee behaviour flexibility is necessary since it allows the employee to handle a variety of circumstances concerning implementation of change. Employees with boosted learning behaviour competences makes the organisation self-sufficient and it need not employ experts to deal with external changes. There are enough indications that behavioural flexibility in organisations helps in enhancing the performance of the organisation as employees with behavioural flexibility generally are more popular and have friendly relations with their co-workers, top management and juniors. They behave in a positive manner in most situations and are able to handle all issues and changes with ease.

3. **Human resource practice flexibility:** This flexibility is concerned with the speed, viability and effectiveness of human resource department in adjusting and executing fresh human resource practices. Human resource practice flexibility in management of workforce states the speed and efficiency at which the organizations can device alternate human resource practices and arrangements. According to the Families and Work Institute's National Study on the Changing Workforce, this flexibility has five segments. These are: choices of overseeing time, flexi time and flexi-place, reduced time, time off, and the fifth segment is culture of adaptability. However, according to the hypothesis of Dension, human resource flexibility comprises of four collective qualities. These are: involvement, consistency, flexibility, and mission. According to the hypothesis, these are vital components of an effective organisation as well. Flexibility of human resource practices is the latitude up to which the organization is willing to adjust in various conditions. Flexible human resource practices allow the workers to have an adjustable work plan which helps them to function comfortably as well as efficiently in various situations.

Organizations that cultivate human resource practice flexibility produce an environment where the workers can handle changes in the environment in a dynamic manner and this helps in providing the organisation competitive advantage and efficiency.

5.8.3 Relation between Human Resource Flexibility and Organizational Effectiveness

Human resource flexibility helps in developing the attitude of the employees in such a way that, in spite of changes in the system, they are willing to remain with the organisation as they have constructed a level of attachment with the organisation. According to

several recent studies, this kind of attachment with the organisation helps in accomplishing competitive advantage and organizational efficiency. According to Tichy, the organisation can perform effectively only if it is able to handle change and develop strategies which help in adjusting to changes in the environment. There are three essential aspects of flexibility which have an impact on organizational effectiveness. First is the capability to recognize and react to the external environment. Second is the capability to answer internal consumers. The third aspect, in order to react to both internal as well as external consumers, necessitates the capability to reorganize and re-institutionalize a set of behaviours and procedures that permit the organization to adjust. According to Dension & Mishra, an organisation cannot be labelled as effective if it fails to implement these above-mentioned aspects. First-hand research points out that the practice of human resource flexibility has a positive impact of the performance of the organisation as it improves the employee's commitment and functioning capabilities. Human resource flexibility has an optimistic impact on creativeness and invention, resulting in organizational effectiveness.

The impact of human resource flexibility is not irrefutable, as practical studies frequently discover adverse effects on worker and team performance. These sometimes result in reducing the efficiency of the organisation. Components of human resource flexibility need to be seen as tactical resources which offer enduring competitive advantage to the organisation as it develops the ability to flexibly achieve the objectives of the company in dynamic surroundings. Therefore, it is assumed that greater the human resource flexibility more developed will be the organizational efficiency.

5.9 INFORMATION SYSTEM FLEXIBILITY

Information System (IS) flexibility is necessary to get pace in Information Technology (IT). An information system can be operational only if it allows flexibility when it comes to accommodating variations in the business processes. Outdated business processes featuring tedious relations and predictable activities will not be able to function in the current dynamic environment. Gradually, organizations must embrace changes and get rid of time-worn and unbending organizational structures and managing processes. The design of the organisation and management processes need to be flexible so that they can survive the competition in the global market. They need to adapt to the frequent technological changes and be able to interpret the demands of the consumers and provide services accordingly. Supposedly, an important factor contributing towards improving productivity and performance is considered to be flexibility of information systems (IS). Scholars have admitted that the increase of flexibility in IS will upkeep flexible and responsive organizations. For example, telecommunication industry has witnessed rapid changes due to technological advancement; it has been able to cope in the changing environment because of its flexibility towards IS.

Information system is described by experts as the 'arrangements of people, data, processes, and IT and their interactions needed to complete organizational tasks' Information system flexibility permits establishments to retain control and respond to continuous fluctuations in highly competitive and fast changing environments. Empirical studies of information systems have directed that there is a close relation between flexibility and efficiency which is identical to the manufacturing system. This has been

Check Your Progress

13. State the concepts of human resource flexibility.
14. List some of the aspects of human resource flexibility.

elaborated by Silver who claims that an inexperienced consumer may not be able to survive in a very flexible system. Soh, Sia, Boh, and Tang specified that growing flexibility of an enterprise resource planning system can result in enhanced complications.

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5.9.1 Scope of Information Systems, IT Systems and Activity-based Development

Information Systems: Several technical professionals observe an information system to be an activity system as all activities are information activities. They catalogue, stock, influence, and submit info about a dominion of importance to players in order to support their activities. An information system provides significant contribution towards material and management activities. Material activities can be facilitated by machines which are digitally controlled. Additional information systems function in a manner such that it is completely entangled with material business activities. They are a fragment of the business activity system rather than just support for business activity. An information system is able to carry out essential activities of business and at the same time, it can provide support to business actions which are executed by various information systems or by individuals. The scope of information systems is wider than the IT-systems. Important information activities are executed by people working in the organisation and the information activities that are accomplished by IT-systems are scheduled and planned by individuals.

IT-systems: Information system in which all performers are IT-actors is referred to as Information Technology system. An intelligible unit of software and hardware is an Information technology actor (IT-actor). It consists of sensors, actuators, memory, and activities. IT-actors use sensors to catalogue information regarding its surroundings in form of selected events, measurement values, etc. The memory of IT-actor helps it to retain information about the events which is stored as history. An IT-actor is able to accomplish activities such as modification of information, dissemination of information, etc. Advanced IT-actors are found in several computer games, internet-based systems, and business intelligence systems.

Outlook on information systems and its relevance in context of business is shown in the figure below:

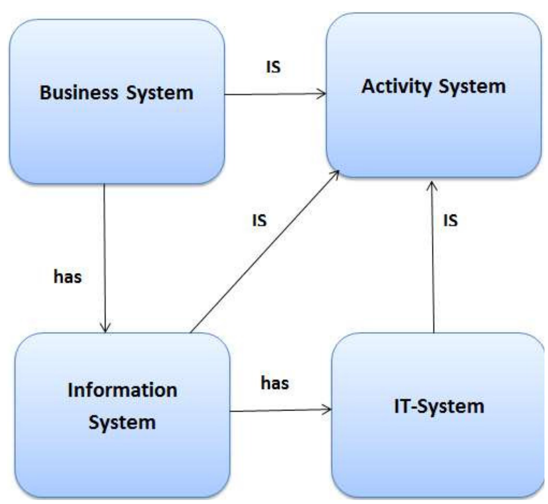


Fig 5.1 *Information System and its Relevance*

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Business needs to continuously experience changes so that it is able to uphold its importance. It needs to develop strategies so that it is able to adjust to the changes in the environment and it can maintain its position during changes by providing fresh and enhanced activities. Information systems help in enabling the business to undertake new activities. These activities also need to experience constant change as the business environment changes.

Activity-based Development: Several methods of systems development are activity-based and these are dependent on having complete understanding of the information systems so that current and future business activities can be developed. There are few old devices such as Structured Analysis and ISAC which utilise models based on graphical flow to indicate existing and future work activities. Multiview is a technique which conglomerates detailed activity analysis with the help of Soft Systems Analysis with Structured Analysis. Once a business decides to alter an information system, the resolution is considered from point of view of actors and activities based in business terms. It is important for the information system to be structured around these terms otherwise there will be a gap between the business related aims and the real information system changes which have to be made. It is maintained that information systems should be organized according to the activities of the business. It is reflected when it portrays IT-systems as activity systems where information technology accomplishes information activities.

Systems in which players execute actions so that value can be generated for consumers and possessors are termed as activity systems. The value may be generated in form of product or service. Activity systems consist of associated actors, equipment, and data. The word actor refers to human beings and IT-systems in spite of the fact that they perform completely separate actions. A non-stop change process is necessary for maintaining the significance of the business. The process of change needs to concentrate on the IT-systems, the information systems, and work activities in all segments of the business.

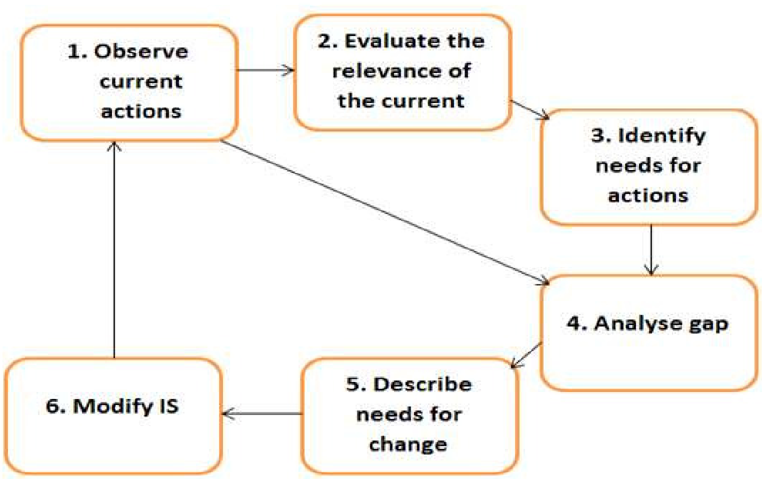


Fig 5.2 *Activity-based Development*

An information systems action range selects the kinds of information activities it will be able to undertake. Where the information system is well organized, the range of action can be larger.

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5.9.2 Types of Information System Flexibility

There are two types of IS flexibility. IS flexibility for practice is the assortment of opportunities delivered by an information system till a greater change is needed. The second is flexibility to change or the prospective adaptability for additional changes of a specified information system. Generally, experts give prominence to the subject of flexibility which has to be used on the functions of the information system which are decided by designers. All structures of IT products need not be planted in the beginning. The resources IT permit uses may not be planned by the developers of the resource.

However, insufficient flexibility of an information system to back a business process precludes the use of the system in some instances. This may restrict the utility of the system along with incurring unwanted expenditure. The kind of flexibility that is composed into an information system influences the system's performance, particularly with regards to the amount of changes which can be made in the system after its implementation.

Information System flexibility is considered very essential for the success of the information technology. Currently, organizations have to perform in increasingly vigorous environments. It is vital to advance information system flexibility with flexible information technology setup. The IS managers need to adjust the application of the systems. Information systems need to be flexible to indulge user necessities, essentially in altering situations. Satisfactory Information System flexibility might elongate the life cycle of information systems and magnify the effectiveness of investments made towards IT systems.

5.10 MANUFACTURING SYSTEM FLEXIBILITY

Manufacturing system flexibility can be defined as a system of manufacturing which allows flexibility to respond to changes, which are foreseen or unforeseen. Flexibility in manufacturing can be explained as the capability to deal with marginally or seriously mixed parts, to permit deviation in parts assembly and deviations in process sequence, alter the production capacity and modify the design of few products which are in production. This flexibility is usually deliberated into two groups; both the groups have several sub-groups.

The first group, machine flexibility, contains the system's capacity to be altered to create new product types and capacity to alter the sequence of operations performed on a part. The second group is called routing flexibility which contains of the capacity to use several machines to execute the same operation on a part as well as the system's capacity to engage extensive alterations, like changes in the volume, capacity, or capability. Most manufacturing system flexibility consists of three key systems. The work machines which are frequently automatic CNC machines are allied by a material handling system to enhance parts flow and are attached to the central control computer which regulates material movements and machine flow.

From 1960 to 1970, the focus of manufacturing systems were focused on cost of production. Subsequently, focus shifted on the quality. Once the markets became multifaceted, promptness in delivering the goods became the focus and requirement of the customer. This led to the formulation of a new strategy which was termed as

Check Your Progress

15. Define information system flexibility.
16. What are the types of information system flexibility?

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customizability. It has become essential for the companies to adjust and make changes according to the external environment They need to be flexible in their operations and have to customise according to the various segments of the market. Therefore, the invention of flexible manufacturing systems is closely related to efforts directed towards accomplishing competitive advantage. Manufacturing system flexibility is a way of functioning in which manufacturers are focused on being flexible in their manufacturing system so that they are able to provide goods promptly and at the lowest cost. Customer satisfaction is the purpose of this flexibility in manufacturing systems. Today, many manufactures across the world are trying to adapt this flexibility so that they are able to gain a competitive advantage in the market. According to a study, it is indicated that American companies spend more funds on product innovation in comparison to process innovation.

Flexibility in manufacturing can be associated with following activities of the company. These are as follows:

- Ability of manufacturing various parts without undertaking any serious retooling
- The agility of the company to swiftly convert its processes to be able to produce new products out of the old line of products.
- The capability to alter a production calendar, to change a part, or to handle numerous parts
- The capability to competently produce extremely customized and exclusive products
- The capacity to avail various aspects for fast delivery
- The ability of a company to offer a wide variety of products to its customers
- The capability to quickly intensify or reduce production levels or to move volume swiftly from one product or service to another

Levels of Manufacturing System Flexibility

Manufacturing system flexibility have three levels.

a. Basic Flexibilities

These are:

1. **Machine flexibility**: The comfort with which a machine is able to process a variety of operations.
2. **Material handling flexibility**: A level of comfort in transporting different kinds of parts and appropriately positioning them in machine systems.
3. **Operation flexibility**: A level of comfort in using substitute operations for the processing of a part.

b. **System Flexibilities**

These are:

1. **Volume flexibility:** A level of a system's ability to profitably operate at various volumes of the current part types
2. **Expansion flexibility:** The capability to construct a system and enlarge it accordingly

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3. **Routing flexibility:** An extent of the substitute routes that a part can successfully track in a system for a specified process plan
4. **Process flexibility**: An extent of the volume of the set of part types which a system may yield without experiencing any arrangement
5. **Product flexibility**: The volume of the set of part types that may be produced in a system with negligible arrangement

c. Aggregate Flexibilities

Aggregate flexibilities are of three types.

1. **Program flexibility**: The capability of a system to perform for a long duration without any external disturbance
2. **Production flexibility**: The volume of the set of part types which can be produced by the system with minor investments on equipment.
3. **Market flexibility:** The capability of a system to competently adjust to fluctuating market conditions

Advantages and Disadvantages of Manufacturing System Flexibility

Advantages: These are some of advantages of Manufacturing System Flexibility.

1. Reduction in cost of manufacturing
2. Lesser cost in producing single units
3. Better labour productivity
4. Superior machine competence
5. Enhanced quality
6. Improved system dependability
7. Concentrated parts inventories
8. Adaptability to CAD/CAM operations
9. Smaller lead periods
10. Enriched efficiency
11. Improvement in rate of production

Disadvantages: These are some disadvantages of Manufacturing System Flexibility.

1. Preliminary set-up cost is high
2. It requires effective and sufficient planning prior to implementing the flexibility options
3. Necessity of skilled labour
4. Intricate systems

Check Your Progress

17. What do you mean by manufacturing system flexibility?
18. List the levels of manufacturing system flexibility.

5.11 SUPPLY CHAIN FLEXIBILITY

International markets are growing very fast and introducing new ways of managing the demand and supply of the market. International enterprises are influenced by the markets of various countries. In order to maintain low cost of production, they are compelled

to establish their production units at venues where raw material cost and labour are economical. This requires strategical planning as dealers for supplying raw material in precise quality, quantity and at right price and place, are required. Companies procure the material from various parts from vendors who are willing to give the best price. The completed merchandises from these locations have to go through a network of distribution which involves a long chain of actors. Some of the actors involved are the wholesalers, retailers and final consumer.

The network of these actors is referred as the supply chain. The concept of supply chain has been defined by several authors and researchers. According to Mabert and Venkataramanan, supply chain management is a sequence of entities which help in transforming raw materials into finished products and supply the product to the consumers. Here, a distinctive 'push' methodology is explained as the unfinished product is pushed towards entities which help to turn it into a finished product and supply to the final consumer. According to Viswanadham & Raghavan, supply chain flexibility is "the ability of a business process to effectively manage or react to changes with little penalty in time, cost, quality or performance".

Harland has defined supply chain management in a more holistic manner. He has defined it as managing business activities and relationships inside an organization, with direct suppliers, with first and second level suppliers and customers along the supply chain. Though, the explanation of supply chain management remains unclear the term 'business activities' has not been properly elaborated. Cohen & Lee have provided a better description of the term as they have clearly mentioned that "supply chain management contains of both intra- and inter-related business activities of a (focal) company. The intra-related part refers to the raw material or component procurement by independent suppliers, through manufacturing and distribution and concluding with successful delivery of the product to the retailer or a customer." From the above definitions, it is clear that in present scenario, supply chain management is no longer restricted to just traditional purchasing and logistics function but has evolved into a comprehensive strategic approach of materials and distribution management.

Flexibility in Supply Chains

In order to have a competitive advantage, the companies need to have supply chain management that is high speed and cost efficient. Subject to the nature of the business, it is established that supply chains function effortlessly in stable circumstances as the complete supply chain is concentrated on economies of scale, distributing supplies quickly in the least cost. However, such supply chains are unable to adjust to the unexpected fluctuations in demand. Numerous studies have explained that present market environments need supply chains which are able to deal and sustain unexpected fluctuations of demand rather than just being prompt and cost effective. Shifting market demand, divergent lead time of the supplier, quality of the product and delayed information are reasons which create ambiguity that generate a necessity for constructing 'flexible' supply chains. These supply chains are equipped to handle changes effectively and efficiently as compared to other existing chains. The flexibility in supply chain will help in achieving a competitive advantage for the business.

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Characteristics to have Supply Chain Capability

According to H.L Lee, flexible supply chain capability of a business has three characteristic. These are:

1. **Adaptable**: Regulate the supply chain's design to encounter structural changes in markets, alter supply network strategies, products and technologies.
2. **Alignmen**t: Generate motivations along the partners inside the supply chain for improved over-all performance
3. **Agility:** The capability of a supply chain to react to short-term fluctuations in demand or supply promptly and deal with outward disturbances efficiently.

These characteristics, especially alignment, are considered prerequisites for a supply chain so that uncertainties can be dealt with. From the above description of characteristics, Lee has defined flexibility in supply chains as: Flexibility in supply chains is the possibility to respond to short term changes in demand or supply situations of other external disruptions together with the adjustment to strategic and structural shifts in the environment of the supply chain. Flexibility thus combines agility and adaptability.

Aspects of Supply Chain Flexibility

1. **Buyer-supplier relationship**: The contribution of both external as well as internal teamsters is essential for growing supply chain flexibility in a corporate. External teamsters refer to demand instability and seasonality while internal teamsters can be explained as low cohesion between products and product timetable ambiguity. These fluctuating conditions help in emphasizing the significance of dual relationship between the parent company and its patrons in the buyer-supplier relationship. This association can be explained as 'sourcing' and 'supply'. Sourcing refers to the capability of the parent company to select and alter the suppliers in case they are not performing well. According to Wadha et al., this is mentioned as routing flexibility. The selection for a supplier is based on the cost and provisions such as demand, inventory and lead-time as they need to be maintained in the entire supply chain process. Even though great prominence is given to costs, it is debatable if this is the main motive in achieving flexibility, when seen from the viewpoint of a buyer. Supply denotes to the capability of a supplier to respond quickly to supply demands. This requires he capacity to regularly alter schedules competently or the ability of a supplier to provide small quantities. These aspects stress on the faith that associates in the supply chain have on each other and their ability to communicate their requirements to each other.
2. **Demand driven and the role of marketing**: The major objective of supply chain management is to generate value for consumer. Marketing provides ample avenues for this objective to be fulfilled. In the absence of suitable activities for marketing, the supply chain will not be able to effectively understand the needs of the customer. According to Radjou (2000), the producers should be able to react to the dynamics of the industry and provide products which satisfy the requirements of the consumer. They should be able to customise the product according to their demands. Traditionally, supply chain activities were an internal process whereas marketing was an outside task. Even though customer is the

focus of a flexible supply chain, this does not result in creating value for the customer. To be able to provide value, the supply chain must have the ability to fulfil all the demands of the consumer.

3. **Production**: Flexibility in production is not just restricted to machine flexibility as process of production involves a number of interrelated sub-processes. The company needs to change several of its activities to be able to adjust the recent production processes. Mentzer has commented that many advanced products require a supply chain which will be able to deal with the uncertainties and continuously changing environments. The supply chain needs to respond with flexible strategies which work towards providing products quickly in the market.

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Taking into account the competitive environment of a company, Viswanadham & Raghavan have listed many forms of flexibility in production which have an impact on the flexibility of the supply chain. These are as follows:

1. **Mix Flexibility**: Capability of a system to instantaneously produce a number of different products in a limited period of time.
2. **Volume Flexibility**: Capability of a system to considerably alter level of production and the nature of the product mix quickly.
3. **New Product Flexibility**: Capacity of a system to increase or alternate new products to the product mix quickly
4. **Delivery Time Flexibility**: Capability of a system to decrease the order time

On the basis of the aspects of supply chain flexibility, H.L Lee has explained the flexible supply chain as the possibility to react quickly so that the changes in the demand can be met by the organisation and the ability of the organisation to react to all external changes. Flexibility, therefore, combines agility and adaptability along with mix, capacity, new product and delivery time. Recent researches advocate that supply chains contribute to firm's flexibility.

5.12 SUMMARY

- In a business context, flexibility can refer to a number of different ideas. Today it's most common usage is in the workplace where it refers to such things as flexi-time, variable hours and extended periods of leave. But the word has a longer pedigree in the area of strategy, where it generally refers to a firm's ability to respond to changes in its environment both rapidly and at low cost.
- Rapid technological and economic changes mean flexible organizations enjoy an advantage over companies that are stuck in their ways. A flexible company is willing to try new approaches, even when the old ways are working fine.
- Structural flexibility represents the features of information systems towards transformation or uniformity. Process flexibility is referred to as the capability of organizations to modify information systems to fresh circumstances.
- Nilsson and Nordahl have defined enterprise flexibility as the flexibility of an enterprise in adequately responding to shifting situations. Upton explains flexibility as the capability to make quick adjustments without wasting time, effort, cost or performance.

Check Your Progress

19. State the concept of supply chain flexibility.
20. List the characteristics required to have supply chain capability.

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- Enterprise flexibility largely contains functional features like research and development, technical alterations and administrative change, invention and venture, alterations and flexibility in the working and internal training of new and old employees. It stresses on managing human resources so that profit margins increase and employees perform in an efficient manner.
- The business model based on flexibility is going to be established in the future and there are many fresh management approaches like BPR, TQM, Supply Chain Management, Business Process Management (BPM), Business Intelligence (BI), and E-Commerce being adopted by businesses in order to bring changes and flexibility in their systems.
- Nowadays, prosperous businesses are looking for fresh benefits in the market with the help of business processes and technologies so that they are able to handle competition. Nonetheless, many businesses are stressed and struggling because of lack of required degree of dexterity and are unable to react promptly and take advantage of the available business openings.
- Aaker and Mascarenhas have defined strategic flexibility as the "ability of the organization to adapt to substantial, uncertain and fast occurring (relative to the required reaction time) environmental changes that have a meaningful impact on the organization's performance".
- Organisational flexibility is very essential in current changing environment. The organisation needs to have a work force which is able to handle the changes. Today rapid changes are taking place in every aspect of life whether it is social, technical, economical, legal and political within the country and abroad.
- Financial flexibility refers to a company's capability to avail the opportunities created by unanticipated openings or its capability to handle unforeseen happenings due to the firm's financial policies and financial structure. For instance, a company which has high liability, fragile foundations and liquidity cannot exercise financial flexibility.
- Marketing is an essential tool of an organisation as it is accountable for constructing an organisation's reputation, handling publicity, sale of the products, and generating customer allegiance. Thus the marketing plan is a vital document that corresponds with other strategy planning of the company.
- Human resource flexibility has been observed as a competence which assists an organization to adjust to altering environmental emergencies According to Beltran-Martin et al., workers who have the benefit of the flexible work system display better participation in the organisational operations and this helps in increasing the overall performance of the organization
- Information system is described by experts as the "arrangements of people, data, processes, and IT and their interactions needed to complete organizational tasks" Information system flexibility permits establishments to retain control and respond to continuous fluctuations in highly competitive and fast changing environments.
- The concept of supply chain has been defined by several authors and researchers. According to Mabert and Venkataramanan, supply chain management is a

sequence of entities which help in transforming raw materials into finished products and supply the product to the consumers.

5.13 ANSWERS TO 'CHECK YOUR PROGRESS'

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1. Flexibility, in the most common way, is defined as, "able to change or be changed easily according to the situation." It is the ability to adapt easily to different scenarios. In our fast-paced world, it is becoming more and more important for businesses to ensure that they are as flexible as possible in every area of their work. However, the main focus is to find out how exactly can this be applied to modern business?
2. Golden and Powell have classified flexibility into four key metrics. These are:
   - Competence
   - Receptiveness
   - Adaptability
   - Vigour
3. Nilsson and Nordahl have defined enterprise flexibility as the flexibility of an enterprise in adequately responding to shifting situations. Upton explains flexibility as the capability to make quick adjustments without wasting time, effort, cost or performance. Enterprise flexibility largely contains functional features like research and development, technical alterations and administrative change, invention and venture, alterations and flexibility in the working and internal training of new and old employees.
4. According to Lake (2006), some of the flexi practices are:
   - Knowledge Management (KM)
   - Multi-Skilled Practice
   - Hot-desking
   - Business Process Management (BPM)
   - Business Intelligence (BI)
   - Electronic Commerce (E-commerce)
5. Raynor has called it an interaction of several components containing: arrangements made based on systematic readings, which investigate possibility of various situations; construction of strategies for every situation; procurement of resources and talents which will be required to implement the strategies; application of the most feasible strategy; and being prepared to shift towards applying new strategy in case there is need.
6. Four forms of strategic flexibility are:
   - The time to react to the alteration in external environment
   - The assortment of possibilities existing
   - The perception
   - The focus area of the flexibility produced
7. Strategic flexibility enables firms many advantages. These are as follows:
   - Strategic flexibility helps in sustaining growth.

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- The companies are able to focus on enhancing their business as they can handle the changes in the market.
- The industrialists incessantly peruse the surroundings for extra opportunities as they are equipped to avail the new options.
- The businesses are able to satisfy the customers better and understand the 'pulse' of the market.
- Flexibility increases the interaction of the top management with the employees. Frequent interaction helps in free flow of ideas and apprehensions.

8. Flexibility in organization of human resources may be defined as organisational flexibility. Normally, organisational flexibility is all about what time it takes to get work done, where it gets done and by what method work gets done.
9. Organizational flexibility are classified into several categories. These are as follows:
    - Functional Flexibility
    - Numerical Flexibility
    - Financial Flexibility
    - Procedural Flexibility
    - Skills Flexibility
    - Attitudinal Flexibility
    - Structural Flexibility
10. Financial flexibility refers to a company's capability to avail the opportunities created by unanticipated openings or its capability to handle unforeseen happenings due to the firm's financial policies and financial structure. For instance, a company which has high liability, fragile foundations and liquidity cannot exercise financial flexibility.
11. Marketing helps in developing the reputation of the company. The flexibility in the marketing strategy provides scope to the company to instantly react to the feedback of the product. The flexibility allows it to deal with aspects of negative publicity as well.
12. A fixed plan enables the organisation to foresee the expenses which are going to be incurred. The plan helps in planning the strategies in advance and helps in constant management of the brand. Flexible marketing plans permit the organisation to rapidly react to changes in the marketplace, avail the new opportunities and solve the issues which rise due to changes.
13. The concepts of human resource flexibility in an organization have generated scope for workers to deliberate, sense and perform in such a way that they are able to attain organization's objectives without thinking about the profits of the organizations.
14. Some of the aspects of Human Resource Flexibility are:
    - Employee Skill Flexibility
    - Employee Behaviour Flexibility
    - Human Resource Practice Flexibility

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15. Information system is described by experts as the "arrangements of people, data, processes, and IT and their interactions needed to complete organizational tasks" Information system flexibility permits establishments to retain control and respond to continuous fluctuations in highly competitive and fast changing environments.
16. There are two types of information system(IS) flexibility. IS flexibility for practice is the assortment of opportunities delivered by an information system till a greater change is needed. The second is flexibility to change or the prospective adaptability for additional changes of a specified information system. Generally, experts give prominence to the subject of flexibility which has to be used on the functions of the information system which are decided by designers.
17. Manufacturing system flexibility can be defined as a system of manufacturing which allows flexibility to respond to changes, which are foreseen or unforeseen.
18. Manufacturing system flexibility have three levels. These are:
    - Basic Flexibilities
    - System Flexibilities
    - Aggregate Flexibilities
19. The concept of supply chain has been defined by several authors and researchers. According to Mabert and Venkataramanan, supply chain management is a sequence of entities which help in transforming raw materials into finished products and supply the product to the consumers.
20. According to H.L Lee, flexible supply chain capability of a business has three characteristic. These are:
    - **Adaptable:** Regulate the supply chain's design to encounter structural changes in markets, alter supply network strategies, products and technologies.
    - **Alignment:** Generate motivations along the partners inside the supply chain for improved over-all performance
    - **Agility:** The capability of a supply chain to react to short-term fluctuations in demand or supply promptly and deal with outward disturbances efficiently.

5.14 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate the significance of flexibility in the business context.
2. Write a brief note on enterprise flexibility. Also highlight its advantages.
3. State the aspects of functional areas of organizational flexibility in an organization.
4. Enumerate the role of financial flexibility to contain various liabilities.
5. Write a short note on the scope of human resource flexibility.
6. Enumerate the types of information system flexibility.
7. State the advantages and disadvantages of manufacturing system flexibility.

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Long-Answer Questions

1. Discuss how flexibility has impacted the business of an organization.
2. Enumerate the shift in business model due to enterprise flexibility.
3. Elaborate the various forms of strategic flexibility.
4. Write a comprehensive note on the types of organizational flexibility.
5. Analyse the need for marketing flexibility.
6. Discuss the relation between Human Resource Flexibility and Organizational Effectiveness.
7. Elaborate the significance of IT-systems while undertaking new activities in a business.
8. Discuss the various aspects of supply chain flexibility.

UNIT 6 COMPONENTS AND COMPETITIVENESS OF FLEXI SYSTEMS

Structure

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6.0 INTRODUCTION

It has been demonstrated by many of the top-ranked global companies and a few emerging Indian multinational companies that the interplay of factors of competitiveness in an organization translates into sustainable advantage, only when 'flexibility of competitive quality practices' is closely nurtured.

Companies adopting flexible technology rather than conventional manufacturing technology can react more quickly to market changes, provide certain economies,

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enhance customer satisfaction and increase profitability. Research shows the adoption and use of technological bases determines an organization's future level of competitiveness. Corporate strategy based on flexible manufacturing technology enables firms to be better positioned in the battles that lie ahead in the global arena.

Although some industries may not be conducive to flexible manufacturing now, many firms are currently utilizing this form of production. Production flexibility has already captured attention in the manufacture of high technology products.

Flexibility in organizations helps in moving towards business excellence. Therefore, companies need to look at flexibility as a core component of all processes, be it operational, leadership, strategy planning and implementation or any other process.

Mergers and acquisitions (M&A) are a common strategy to bring about change.The companies often choose to be a part of a merger arrangement so that they are able to strengthen their chances of survival.

This unit gives a high level view of components and competitive flexi systems with particular emphasis on how competitive flexibility can bring in transformative changes in companies.

6.1 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Understand the components and competitiveness of flexi systems
- Explain flexibility in technology and product offerings
- Explain flexibility in business excellence and service offerings
- Analyse flexibility in mergers and acquisitions (M&A)
- Enumerate flexibility in strategic alliances
- Analyse competitive advantage due to flexibility

6.2 UNDERSTANDING THE COMPONENTS AND COMPETITIVENESS OF FLEXI SYSTEMS

Manufacturing industries are facing many challenges in keeping up with fluctuating market needs and lifestyle trends of modern society. Globalisation has completely changed the current market trends. In the present corporate setting the competitiveness of all manufacturing industries is dependent on their capacity to react promptly to the briskly shifting market and to provide products of superior quality at low prices. However, the cost of the product is not the only factor which has an impact on the manufacture's position in the market. The market positions are based on competitive aspects like flexibility, quality, effective delivery and consumer satisfaction and several other factors like the usability of the product.

Businesses are struggling to accomplish these competences with the help of automation, robotics and various innovative concepts like just-in-time (JIT), Production planning and control (PPC), enterprise resource planning (ERP), etc. The concept of flexible manufacturing permits the manufacturing systems to be constructed with advanced technically customized production necessities. Then there are concerns such

as lessening of inventories and reducing the market-response time so that the demands of the customers can be fulfilled. In order to become accustomed to fluctuations in the market, decreasing the cost of merchandises and services to stay ahead of the competitors, etc. have compelled the businesses to adopt flexibility of manufacturing systems. The companies in order to maintain a competitive advantage need to not only consistently provide quality products at a low cost but at the same time, they need to become flexible. They have to adopt flexible manufacturing systems (FMSs) in form of an automatic set of mathematically controlled machine tools and material handling systems. These systems have the ability to perform a varied range of operations with the help of fast tooling and instruction conversions.

The attribute of flexibility lies in creating a diverse model of manufacturing system which can cope with changes to a certain level in fragments or the complete product design. These changes are handled without disturbing the production line. Flexibility develops the ability to adjust to an extensive kind of possible environments.

6.2.1 Competences for Flexible Manufacturing Systems

In order to be flexible, a manufacturing system needs to have the following competences:

- Recognising various production units which will be able to execute the exact operation
- Fast conversion of functioning instructions to the automatically controlled production machines
- Fast conversion of physical systems of fittings, tools and other working units

These competences of modern business environments are engineered with the help of an automatic system that is supported with sensor system as they are difficult to accomplish manually. Flexible manufacturing system provides the required tools to achieve these competences. The term flexible manufacturing system denotes an extremely automatic GT machine cell, comprising of an assembly of computer numerical control (CNC) machine tools and auxiliary terminals, connected by an automatic material handling and storage system, and all controlled by a disseminated computer system.

These manufacturing systems are flexible because they are able to process a variety of reason. The FMS is called flexible as it is capable of processing a selection of diverse part styles instantaneously due to the fast tooling and instruction conversions. Furthermore, capacities of productions can conveniently adjust to fluctuating demand configurations.

6.2.2 Components of Flexi Systems

a. **Machine Flexibility**: It is the competence to adjust a particular machine in the system to wide-ranging production operations and part styles. The machine flexibility enhances if the range of operations is vast. There are several factors which have an impact on the flexibility of machines. These are:

1. Start up or changeover time
2. Convenience in down-loading part-programs to machines
3. Capacity of machines in storing the tools
4. Expertise and adaptability of manual workers in the systems

b. **Production Flexibility:** It is the kind of part styles which can be produced on the systems. The kind of part styles produced by a manufacturing system at reasonable cost and its duration is dependent on the process envelope. The factors which affect the flexibility of production are:

1. Flexibility of machine at separate stations
2. Kind of machine flexibilities of total stations in the system

c. **Mix Flexibility:** The capacity to alter the product mix but retaining the overall production quantity. It involves producing the same parts but in different proportions. This is referred as process flexibility. Mix flexibility offers safety against market fluctuations by enabling changes in product mix in spite of using shared resources. Greater variations in the product mix will require employing more number of tools, fittings, and varied resources. Factors which have impact on mixed flexibility are:

1. Correspondence of parts in the mix
2. Machine flexibility
3. Comparative work content intervals of parts produced

d. **Product Flexibility**: It denotes the capacity to completely shift to new range of products in a cost effective manner. The changeover needs to be prompt so that changing requirements of the market can be fulfilled. The changeover time takes account of the time which will be required for creation of design, preparation, tooling, and fittings which will be required for introducing the new products in the manufacturing line-up. The factors that have an impact on the product flexibility are:

1. Connection of new part design with the prevailing part designs
2. Ground work needed for off-line part program
3. Machine flexibility

e. **Routing Flexibility:** It can be described as ability to produce parts on different workstation due to breakdown of equipment or failure of tools. This flexibility allows continuous production process as there are no interruptions. It helps in amassed output, and sustains the external changes which may occur due to product mix, changes in engineering or introduction of a fresh product. The factors that have an impact on the routing flexibility are:

1. Resemblance of parts in the mix
2. Common workstations
3. Shared tools

f. **Volume Flexibility:** The capability of a system to alter the volume of production so that the changed demand can be fulfilled. The flexibility tries to maintain the cost effectiveness of the production process in spite of the changes. This is often referred to as capacity flexibility. The factors that have an impact on volume flexibility are:

1. Competency of the physical labour responsible for the production
2. Extent of investment incurred on capital equipment

g. **Expansion Flexibility:** It denotes the comfort with which the system is able to expand in order to undertake the complete production capacity. Factors, which have an impact on expansion flexibility depends, are:

1. Expenses sustained in accumulation of fresh workstations and skilled operators
2. Comfort experienced in expanding the layout
3. Kind of part management system put to practice

As flexibility is inversely related to the sensitivity to change, a portion of flexibility requires computing the "penalty of change". This is measured by multiplying the penalty with probability so that POC can be figured (POC = penalty x probability). In this the penalty equals to the extent up to which the system is fined due to the changes made against the system constraints in relation to assumed probability. Lesser the value of POC, greater will be the flexibility of the system.

6.3 FLEXIBILITY IN TECHNOLOGY: AN OVERVIEW

The environment in which the organisations have to function currently is full of changes and turmoil. The business processes have to be truly flexible so that they are able to reduce the product cycle duration, handle the global competition, sustain an increasingly controlling environment and provide products which are dynamic and cost effective at the same time. Business process flexibility is a vital element for an organization to be able to adjust and contest. Augmented flexibility provides the organization a competitive advantage as it is able to swiftly respond to the needs of the customer and the environmental changes. Business processes of organisations are immensely influenced by the level of its technological flexibility as this equips the organisation to handle change. Developing technologies must be able to bring about changes in the business environment. Technology helps in improving the manufacturing processes of the organisation; hence several businesses have gained flexibility of technology in their operations. The prime method of flexibility has been achieved by investing in computer integrated manufacturing (CIM). These projects have helped in developing interactions between technical know-how and people which has led to process flexibility.

6.3.1 Flexibility in Technology and Changing Business Processes

Earlier, flexibility in technology was weighed from just the computer science perspective and the scope was limited to technology alone. The earlier technological advancements provided rigidity to the organizations instead of flexibility. The technological changes seemed to be very time consuming. Current technology helps in providing opportunities that remove the obstacles to business process flexibility. This is done with the help of changes in the structural features such as language and design. Technology has both positive and negative impact on flexibility. The positive impact is possible only if there is a close relationship between the technology and the owners of business process and adaptability to changes in the processes. Once the need for change in business processes is realised, technology can contribute towards providing flexible systems. Emerging technologies support business processes. Davenport has defined a business process as "a structured set of activities designed to produce a specified output for a particular customer or market". According to Harrington, a business process is a "group of logically related functions that use the resources of the organization to produce results". These functions work in an interconnected manner to steadily create a definite result. The business process is explained as a definite series of interconnected functions which aim at producing a definite outcome for a certain customer or market.

Check Your Progress

1. How are manufacturing industries coping with competitiveness in modern corporate setting?
2. List the competencies needed by manufacturing system.
3. What are the components of flexi systems?

In order to achieve flexibility in technology, it is essential to understand this environment as it helps in defining form of the nature of change essential of a technology to support the business process. Unsettled environments are capable of reorganising the structures in the organisation and bring about changes in the processes or completely do away with the process. As soon as innovative organizational structures and measures are developed, a series of constant enhancement starts. Correspondingly, the thoroughly altered or substituted technology starts a series of constant enhancement in order to back the innovative business processes. Technologies have to function effectively while changes are occurring. This will be possible only if there is flexibility in technology. The flexibility will allow the technology to adjust to stable as well as unstable environments.

6.3.2 Technological Adaptability and Adaptation

Unsettled changes in the environment can create the necessity for fast and drastic changes in methods of conducting business. These changes can make a competent manager to function in an unfamiliar manner. The feature of adaptability countenances the organizations to absorb the unfamiliar ways. Huber had defined adaptability as "the capacity to expand niches or to find new niches". Adaptability is mostly the outcome of or response to unsettlements in the environment. One feature of adaptability is preparedness to participate in an unfamiliar environment. Unsettled environments provide new opportunities to adaptable organisations. They are equipped to face the new activities and integrate the unfamiliar.

Organisations are able to face the unfamiliar only if they have the flexibility of technology. Technology backs the structures and readies the organisation to adapt newness. The documents and tasks of the adjusted organization need to be freely incorporated and outmoded ones effortlessly cast-off. The capability to change must be an inbuilt part of the existing technology scheme. Huber has explained another feature of adaptability as the aptitude to probe the outside environment for extension into different functions. The organisation should not only be able to sustain and absorb the unfamiliar, but at the same time, try to pursue avenues for development. Pursuing the environment compels organizations to inspect the existing business and to adopt new profitable and workable functions. This helps in redefining the business. Regrettably, most of the technology of the organization is adequate for the current functions. An actual test of adaptability of the technology will be noticed during these changes as its ability to accommodate new functions will be put to test.

Allen and Boynton explain adaptable systems as vigorously steady information systems. These systems have a steady platform of competences and prove to be flexible in the long-run. They hold high levels of software applications, recyclability, associations, and are able to link with extra systems. The arrangement of these systems delivers the competence to radically change and the modified units can be effectively amended for improved application in particular business process. Hedberg and Jonsson uphold that information systems must include the ability to forecast the future besides having the capability to deal with unforeseen changes in the existing environment. This suggests that technological flexibility allows the business processes to not only adjust to the changes, but at the same time, it is able to provide opportunity for future innovations. The feature of adaptability embodies innovative changes in the business

process environment; Huber has defined adaptation as the augmentation of a certain function or business process.

Business process improvement (BPI) and total quality management (TQM) are illustrations of initiatives taken by the organisation to enhance technology flexibility and these highlight adaptation. These statements establish that flexibility in technology embraces adaptability and adaptation. Attaining flexibility in real sense would result in "less penalty in time, labour, cost, or performance". According to De Groote, flexibility is expressed in terms of generating the pre-eminently potential performance in the circumstances of changing environment. On the basis of the above discussion, flexibility in technology can be defined as: "The capability to adjust to both incremental and radical changes in the organisation or business process with least penalty of time, effort, cost, or performance."

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Business process improvement (BPI): It is a strategic planning methodology aimed at identifying the operations or employee skills that could be improved to encourage smoother procedures, more efficient workflow and overall business growth.

6.3.3 Dimensions of Technology Flexibility

The information systems writings have observed flexibility from numerous perspectives. According to Silver, flexibility is the opposite of restrictiveness. He feels that less restrictive and extra flexible decision support systems provide avenues for originality and learning. According to thinkers Silver and Schwan and Jones, flexibility in information systems helps in adapting creative changes. The theory of Information Technology (IT) has applied flexibility in three areas: flexibility in functionality, flexibility in use, and flexibility in modification. Flexibility in functionality and modification deal with the adjustments made because of incremental change or inconsistency.

Flexibility in use deals with the incremental changes as well as its capabilities to incorporate fresh relations and openings. It indicates that this capability for modification is constructed into the system. These information technology dimensions of flexibility are diligently connected to environmental stresses on organizations. Flexibility is projected as a multi-dimensional notion that offers an opening for theorizing technology flexibility. These three dimensions, put forward by Knoll and Jarvenpaa, incorporate the capability of technology to change towards incremental as well as environmental change. However, they do not address the role of people of the organisation while these technology changes are taking place. According to Scott, it is important to discuss the response of people of the organisation. The flexibility of technology alone is not able to improve the businesses processes if it is not supported by the person who is going to initiate the change. A technology's structure might be extremely flexible. However, if the management processes backing it are severe, complete flexibility will be obstructed. The helpfulness of people in responding to executing, and performing change improves or obstructs technology upkeep.

6.4 FLEXIBILITY IN PRODUCT OFFERINGS

The amount of receptiveness or adaptableness in the product design may be referred to as product flexibility. The reaction of the company towards bringing changes to the design of the product or introducing new product which is completely different form the existing product can be defined as flexibility in product offering. A flexible design reduces the cost of redesigning and allows the producer to quickly respond to the demands of the consumers. The altered product will be able to perform with more

Check Your Progress

4. What is required to achieve flexibility in technology?
5. List the area where Information Technology (IT) has applied flexibility.

efficiency. Many manufacturers offer products that are specifically designed to present additional flexibility for the end consumer and product lines that can serve their entire market base.

Flexible product development is the ability to make changes in the way the product is developed in the design stage as well as later in the process. The changes are made without disrupting the other components of the product. The level of flexibility helps in implementing changes with less disruption. Flexibility is essential as the improvement or introduction of new product has to be dissimilar for the existing version. The changes are required as the product needs to satisfy the customer's demands and usability. The changes will be required to gain a competitive advantage and the new product will require new technologies in the manufacturing process. Flexible expansion frustrates the predispositions of several modern management approaches, as these approaches discourage changes in the plan and for that reason they involve complete planning of the project from the beginning. These contain Six Sigma; the goal is to evolve a system with no scope for changes and wastage. These involve old-fashioned project management and systems which are based on phased development such as the standard Phase-gate model. In this system planning is done in the beginning and efforts are made to follow the plan completely. These techniques are not able to work in the current manufacturing processes as the demands of the consumers often change and the businesses have to continuously introduce innovative products so that they can sustain the competition. There is a need for complete flexibility in the product offerings of the companies and they cannot rely on rigid methodologies for the same. Though, in certain cases, flexibility practices prove to be exceedingly expensive and the company cannot sustain such expenditures, flexibility in product offerings must be decided with care and may be implemented in certain parts of the product rather than completely change.

Flexible expansion utilises a number of methods so that the change can be made cost effective and rapid. These methods contain modular designs to capture change, research and recapitulation to try the outcomes and take feedback from the customer regularly, tried and tested design to construct and conserve options, and developing procedures that improve in the course of a project as per the needs of the product.

6.4.1 Flexibility in Product Offerings and Role of Marketing

Marketing and production are interconnected functions as forecasting the capacity is designed to meet the requirements of the market. This concept is maintained by Grittenden and he points out that capacity apportionment encompasses crucial decisions between production and marketing functions. Hence, capacity flexibility must be given emphasis as it permits the businesses to take the following steps:

- Alter the volume of production as per the demands of the consumers.
- Enable production of various products using the same machines so that the demand can be adjusted as per the needs of the consumers.
- Change product technology and process technology to preserve or increase an organization's competitive situation.

The close relation between production strategies and marketing has been further addressed by Hill. He has recommended using the product life cycle in concurrence

with product volume data as it helps in guiding the improvement of manufacturing strategy. He favours connecting the volume of the product and aspects like quality, budget, and creativity to be maintained throughout the production of the product. In a parallel approach, Primrose and Verter maintain that outlining needs of customer enables the managers to create the quantity of change and ambiguity that the manufacturing abilities have to handle, and consequently outlines the level of flexibility that is essential.

Flexibility of Product offering needs the following marketing strategies in order to launch a new product in the market:

- Generate awareness about the product awareness and provide samples
- Attain complete knowledge about the customer knowledge
- Awareness about the segment of the market
- Feedback of the customer

These strategies have to be clubbed with various operation strategies such as, providing basic production competence, undertaking lesser production runs and drawing experienced workers. These operation strategies when combined with the required market strategies will help in providing products which are as per the need of the users and the consumer will be aware about the availability of the product as well. Flexibility in product offering enables the manufacturer to provide customised products to the consumers. These products have various functions which help in satisfying the customers.

This flexibility in products features enables the business to be receptive to the market by empowering it to provide quick freshly designed products in the market. The present manufacturing processes have to be strong so that they are able to handle the increasing competition, fast changing markets and the consumer demands. The manufacturers need to increase the variety of the products and at the same time have efficient product cycles for quick supply. These situations necessitate a flexible manufacturing enterprise with flexibility in product offerings as well.

6.4.2 Role of Flexibility in Product Offerings

According to Kara et al. has outlined the following ideas for stressing the important role flexibility in product offerings plays in rendering a competitive advantage for the organisation. These ideas are as follows:

- Product flexibility lets the company to be receptive to the market by allowing it to introduce freshly designed products rapidly to the market.
- Product flexibility helps the process to adopt latest technology for the operations which increases the future efficiency of the organisation.
- Flexibility equips the company with a challenging competitive defence to react to fluctuations in the markets and ambiguous product life cycles.
- The flexibility allows small scale businesses to adopt strategies which are essential for handling the tough and irregular orders. The new products can be designed as per the need of the users.

The business firms have to be flexible so that they are able to present and create new parts and products. The market is constantly in demand of a new product as the lifecycle of products is very short. The companies have to frequently offer new products so that they can maintain their position in the market. The flexibility in offering frequent

new products helps in integrating the marketing and production strategies of the organisation. Marketing strategies help in realising the needs of the consumer and production strategy helps in securing the amenities and resources needed for manufacturing the products or parts which are appealing to the customers. Kara et al. further comments that fresh product flexibility helps fast production of goods and this he feels is essential for the organisation. With the advancement in technology, the consumers have become aware and knowledgeable and by providing them with products at a fast pace allows the firm to maintain its competitive advantage.

6.4.3 Need for Flexibility in Product Offerings

It has already been established in above sections that the current markets experience frequent changes and the products in the market have a very short span and there is constant need for companies to introduce new products. There are a number of factors which compel the companies to be flexible while offering products to the consumers. Few of these factors are mentioned here:

- Changes in external as well as internal environment
- Short span of products demand
- Demand for customised products
- Overpowering pressures of technological advancement and globalisation
- Rapid and radical fluctuations in the expectations of the consumer
- Quest for having a competitive advantage among the companies
- Adaption of new technology for improved processes to be established
- Customers frequently shift to different brands to suit their needs
- Nuclear family system has reduced the quantity of products consumed by a house-hold
- Consumers get bored and dissatisfied with products easily and frequently
- Frequent changes in the taste and style of consumers

In view of these factors, it is essential for the businesses to be actively creating new products so that they can offer the consumer what they need and maintain their position in the competitive market.

6.5 FLEXIBILITY IN SERVICE OFFERINGS

In present times, the success of a business centres on quick response to the changes in the market, international upheavals or new demands of the customer. Promptness and alertness are the latest fundamental proficiencies for any twenty first century industry. The advancement in the technology is the key to enhance the capabilities of the business whether in innovative products or services. The technology helps a business to be the pioneer in offering a new product or service. The stage has come when the companies need to revamp their operations to curtail unnecessary expenses on ineffective technology and put in place investment in effective information technology services. This will be possible only if the business adapts flexible service delivery options with the help of utility and on-demand computing; as-a-service applications, infrastructures

and platforms; and private, public and hybrid clouds. These applications help the business to develop their competences as leading architects of information technology in conglomerating social, mobile, and analytic and cloud technologies (the SMAC stack) to generate a flexible, accessible platform which backs extra cooperative and wide range of functions. Adapting the model of flexible services delivery is essential for the success of the company in the current business environment.

Service offerings: A service offering defines a level of service for a price: it combines the service (utility) and a service level target (warranty) to bring value to the customer.

6.5.1 Designing a Flexible Service Delivery Model

Creating flexibility in **service offerings** takes into account several factors such as the level of maturity of the company, enthusiasm towards taking risk, competitive advantage and strategic objectives. The level is decided on the basis of its performance, safety, needs of the consumers and its usability for them. Flexible service offerings also depend other aspects. Some of them are as follows:

1. It is important to determine the weakness of the business such as rigidness, lack of swiftness, low performance, gaps in security, high investments, weak processes and undeveloped service management. It is essential to establish the areas of weakness. All of these aspects can be resolved with the help of flexible service delivery, but that will be possible only after the identifying the weakness.
2. Adapting the changes in stages will help in selecting the functions and processes which need to be shifted to the flexible service delivery model. This involves a "core vs. context" examination, where organisation identifies the activities in which the company's performance is updated and the ones which are proving to be deterrent towards attaining a completive advantage. The organisation has to identify whether it needs help of external specialist to overcome its weakness.
3. Most companies adapt flexibility in service by starting from the processes which involve less risk. They choose to initiate the alteration with non-production environments, like testing and development, as these have low functional requirements and do not necessarily impact the final-consumers and the clients. Alternative option is to introduce the model for functions of the back-office, such as e-mail and time record. Companies which are in a hurry to introduce product and services in the market adapt flexible service model in important operations as well.
4. Deliberation of application resource necessities is an alternative option. Analyse the amount of resources available and the amount each resource is going to be consumed. Installing resources which are not useful will lead to unnecessary expenditures.
5. The flexibility in service offering has to take into account the cultural challenges. The information technology system should be able to improve the vigorous competences of a flexible service delivery model. The employees need to be trained and become aware about the benefits of a flexible system as this will help in conducting business in an efficient manner. For example, after the technology infrastructure has been improvised it will be able to rapidly develop the applications and the processes of the organisation. The flexibility in service offerings has to be collaborated with other systems of the organisation. The flexibility in one aspect will not be enough if the rest of the applications remain

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rigid. The task is to successfully influence the changes in product cycle time and enhance it throughout the system so that there are no bottlenecks.

6. Flexible service offerings analyse all service requirements of the clients so that their demands can be customized accordingly. The service levels have to be sufficient for an environment in which product is used.
7. Safety is a prime consideration, especially for applications and systems which provide personal data. Service providers nowadays usually undertake safety audits seriously.
8. Demand a great level of openness so that the companies are able to monitor the environmental changes and all the essential parameters. If there is transparency, routine decisions can be made easily and this also helps in managing the financial aspects of the product.

The old business approach of providing the product will not be able to sustain the competition of the international economy. The traditional infrastructures need to be replaced with flexible ones so that companies are able to keep up with the world market setups. The changes, which are needed for providing flexibility in services, may seem very vast but if the focus is maintained on key areas, this flexibility will enable companies to adapt changes quickly and efficiently. It will prepare them for future changes as well. The changes required to move to a ûexible service delivery mode can seem overwhelming. But when you map out what needs to happen, you can more clearly focus on the key choices and considerations you need to make.

6.5.2 Ways to Improve Flexibility in Services

A vital area of cultivating flexibility in services and manufacturing is done by balancing the objectives of the operations. The objectives of operations are to provide satisfaction to the customer and judicial usage of resources. Once the basic necessities of the customer are realised then the only thing left is to collaborate it with the available resources. If the services are provided on the basis efficiently using the resources then consumer satisfaction will not be completely achieved. With the provision of unlimited resources most systems will be able to provide services but it may not provide consumer satisfaction. Therefore, the services have to be flexible so that the capabilities of the organization are able to provide the satisfaction to the consumers.

6.6 FLEXIBILITY IN BUSINESS EXCELLENCE

Business Excellence (BE) is focused on evolving and supporting the management systems and processes of an organization so that efficiency can be improved and more value can be generated for the stakeholders. Business excellence is not just limited to establishing systems which are of high quality; its scope covers every aspect of the organization. The excellence has to be reflected in management, approaches, customer focus, controlling information, workers, and processes and essentially on attaining higher business outcomes.

6.6.1 Elements of Business Excellence

In an integrated leadership and management system, these elements are essential to organisations sustaining high levels of performance. These are as follows:

Check Your Progress

6. What do you understand by flexibility in product development?
7. What steps does a business need to incorporate capacity flexibility?
8. What are the factors which need to be taken while applying flexibility in service offerings?

1. **Farsighted leadership**: The top management of the organization should be capable of setting directions and generate a customer focus, vibrant and observable structural values, and high potentials for the staff. The guidelines, morals, and expectations must provide equilibrium to the requirements of all the stakeholders.
2. **Customer-driven excellence**: The customers of the organisation judge the quality and the efficiency. Hence, the organization needs to be considerate towards the features and the nature of the product from the customer's point of view so that the product is valuable of the customer.
3. **Training and knowledge sharing**: The staff of the organization can achieve high levels of performance only if they are completely knowledgeable about the approaches of the organisation. The flexibility in business excellence will be possible only if the organisational approaches are systematically imparted to the staff. The approaches need to be updated regularly so that they can be based on innovative processes.
4. **Appreciating staff members and associates**: An establishment's triumph rests on its workforce who is efficient and well-guided. The staff can function efficiently only if they are provided with secure, credulous, and supportive environment.
5. **Swiftness:** Success in present day's constantly changing, internationally competitive environment stresses on swiftness. The organisation needs to contain the competence to rapidly change and be flexible.
6. **Emphasis on the future**: Guaranteeing an establishment's sustainability necessitates accepting the present and future changes which are required for maintaining its position in the market.
7. **Handling innovations**: Creating significant alteration to improve the products, services, programs, processes, operations, and business model so that new value can be generated for the shareholders and the consumers.
8. **Managing by statistic**: Establishments rely on the magnitude and examination of performances. These magnitudes are the outcome of strategies and business requirements. They need to arrange for essential facts and data regarding the strategic processes, productivities, and outcomes.
9. **Activities should be beneficial for the society**: The leaders of the organization ought to emphasize the social duties of the employees. It is essential that business excellence is achieved by maintaining the social well-being and through ethical means.
10. **Emphasis on outcomes and generating value:** The performances of the staff of the workers in an organisation should be reflected in the outcomes. The outcome of the activities should be beneficial for the consumers as well as the shareholders.
11. **Holistic perspective of the systems**: It is essential to manage the organisation with an approach which is taking into account all the performance of components and measuring the success. Excellence in business is not about efficient working

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of few systems, there is a need for all components to interact and align their successes.

Business excellence model supports the assessment of the organization's strengths and weaknesses as it highlights the sections and systems which need to be improved. The BE helps in providing the guidance for future actions. It enables the top management to adopt a holistically approach towards business due to which they are able to take sustainable steps to measure the success of the organisation. Business excellence model provides consultancy services to the organisation. BE ensures that all decisions related to business are taken keeping in mind the requirements of the shareholders and these decisions are integrated with the goals of the organisation. The BE helps the organisation to maintain its position in the international market.

6.6.2 Flexibility for Business Excellence

Business excellence model of organisations helps in understanding and assessing the processes that require improvements so that they can perform better. While analysing the level of excellence in an organization, it is essential to consider the outline of the organisation as all systems work in diverse manner. The excellence of the organisation can be reflected in the prevailing atmosphere, relationships, strategies, attitude towards changes, challenges in competitive advantage.

The business excellence model can be established in the company only if there is flexibility in the following areas:

1. **Leadership**: It observes how the actions of the top management guide the employees. Individual actions of the seniors of the organisation are essential for providing guidance to the staff so that the organisation is able to maintain its sustainability. Behaviour of the seniors reflects on the governance styles of the organisation. This exhibits the organisation's responsibilities towards society, its morals and lawfulness is essential for its support of the community.
2. **Strategic planning**: It observes how the strategic goals and the activities to achieve them are developed by the organization. This also examines how the selected strategic goals and activities are executed and altered in case the conditions change. The planning helps in measuring the progress of the organisation.
3. **Customer focus**: It observes how the organization handles the customers to achieve a competitive advantage in the market. This handling reflects the degree of organisations involvement with the demands of the customer and how far it is willing to implement these demands. The focus on customers is very essential to build a communicative relationship with them so that the input received from them can help in improving the product and incentive of innovations is created.
4. **Management of knowledge**: It observes the way an organisation chooses, collects, analyses, copes, and develops its facts, data, and knowledge and on the basis of the knowledge attained how the organisation improves the technologies so that the performances can be improved.
5. **Focus on staff**: It observes an organisation's capacity to measure its staff capabilities and talents. This evaluation helps in identifying the areas which need to be enhanced by making provision for adequate training and knowledge sharing.

This focus helps in creating an environment which enables the staff to perform efficiently. The observations in this category outline the inbuilt talents of the workers which can be utilised by the organisation to create future innovations.

6. **Focus on operations**: It observes how the organization plans, handles, and advances its existing systems and processes. This focus enables the organisation to provide value to customers and accomplish success for the organization and sustain the changes in the markets as it prepares the organisation for unexpected changes.
7. **Outcomes**: It observes the performance of the organization and the areas where improvement has taken place. The success of the organisation is proportionate to the performance of the competitors.

Business excellence processes help in managing innovations. Hence, it is imperative to know the ways in which the top management contributes in attaining conducive conditions for innovations; the way the organisation's strategies are encouraging inventions in products, operations, and delivery of services; the effectiveness of the operation process for creating unique designs of the product and the services; the way consumer's feedback helps in identifying innovative opportunities, performance of the competitive organisations, benefits of various ideas and talents in improving the performances. The organisation has people from different cultures. An integration of their ideas and knowledge will result in creating innovative products. The business excellence will be established only if there is flexibility in all the above areas as only then the organisation will be able to adjust and respond to the changes in the external environment and earn a competitive advantage.

6.7 FLEXIBILITY IN MERGERS AND ACQUISITIONS (M&A)

The transactions, in which the proprietorship of companies, business organizations or few of the operational units of a business are reassigned or joined, may be referred to as mergers and acquisitions. It is considered as a feature of strategic management. Mergers and acquisition enables an enterprise to develop, expand, and reduce. These alter the nature of the business or provide a competitive point.

6.7.1 Explaining Mergers and Acquisitions

In legal terms, a merger is a legal alliance of between entities to form a single unit, while an acquisition takes place when one unit is taken over by a new unit. The acquiring unit gets hold of the stock, equity interests or assets of the acquired unit. From an industrial and financial viewpoint, these transactions lead to merging of resources and liabilities into one unit. The end result makes both the transactions to be similar. In legal terms, acquisition may place one business under another business directly and the shareholders of the business are also indirectly under the ownership of the acquirers business. In a merger, part of the ownership and control is shared and part control remains with the shareholders. A transaction might be decorously termed as a "merger of equals" if owners of both the businesses reach an agreement that amalgamation is in favour of both the organisations. Although when the transaction is inimical, it is often termed as an "acquisition".

Check Your Progress

9. What do you mean by business excellence (BE)?
10. List some of the elements of business excellence.

The objective of M&A is usually for two companies to generate enhanced value and performance. These companies merge as they are unable to perform well independently. The aim is to maximise wealth and improve the scope of innovations and strengthen the market position. Mergers & Acquisitions take place when: assets are purchased, common shares are purchased, asset shares are exchanged or shares are exchanged for shares.

There are two forms of mergers; one of them is executed by immersion and second is with partnership. From a financial perspective, mergers can be categorised in three types. These depend on the nature of the business; when merging is between two similar industries, it is termed as horizontal; when it is between different production phases or value chain, it is termed as vertical and when merging between to different industries, it is termed as conglomerate. In legal terms, different types of mergers may take place such as, short form merger, statutory merger, subsidiary merger and merger of equals.

6.7.2 Purpose of Mergers and Acquisitions

All mergers and acquisitions have one common goal: they are all meant to create synergy that makes the value of the combined companies greater than the sum of the two parts. The success of a merger or acquisition depends on whether this synergy is achieved. Broadly speaking, these are the main purposes of mergers and acquisitions. These are as follows:

- Monetary collaboration for lesser cost of capital
- Enhancing the performance of the company so that there is increased development.
- Cost-cutting of scale
- Broadening markets for developing new products
- To intensify the share in the market share and strengthen the position in the market
- Strategic readjustment and technical modification
- To address the tax concerns
- Increase the target estimation
- Broadening of risk-taking capabilities

The merging of two companies always generates a synergy for value. This synergy is visible in the increased revenues, lesser expenses and shrinking of entire cost of capital.

6.7.3 Need for Flexibility in Mergers and Acquisitions

Companies involved in merger and acquisition ensure that all aspects have been taken into account diligently. Flexibility plays a critical role here and there are several reasons. Some of them are:

1. Both the parties should be willing to take risk and monitor their investments closely so that they can benefit from the transaction.
2. Expanding the options by taking multiple risks so that success possibilities can be increased. Limited risks will give limited results.

3. The controlling body of the buying firm should be strong, tolerant and should be able to embrace changes as the business environment is constantly changing.
4. Flexibility is needed to team up the strategies according to the objectives of both the systems.
5. Flexibility is needed for effectively managing the integration of design and planning. The implementation of designs will not be possible in the absence of integration.
6. The mergers need to be flexible so that both the parties are diligent about all aspects of the operations.
7. There is the need to optimistically project the targets of the company so that sound decisions can be made during changing environments.

The companies need to discuss all the terms and plans openly with each other. They need to be jointly working towards the same targets and have complete understanding of their terms. An example of unsuccessful merger was witnessed between IBM and Sun Microsystems due to discrepancies in costing and other terms.

Mergers and Acquisitions are deliberated as significant agents to bring about change. This makes them a very significant aspect of most business strategies. It is a common understanding that since new businesses are constantly surfacing and the ones which survive are developed with the most innovative and agile systems so that they are able to sustain the market competition. The companies often choose to be a part of a merger arrangement so that they are able to strengthen their chances of survival. The arrangement of merger and acquisition lasts only if there is complete understanding among the participating companies and they both are able to blend with each other to achieve the common goals.

6.7.4 Role of Viability Analysis in Mergers and Acquisitions

Both the companies must undertake a viability analysis before entering into a deal with each other. It is essential to recognise the technical and business limitations for each alternate.

Viability analysis includes the following classifications:

a. Economic viability analysis delivers cost-effective rationalization of a system. These might involve attainment, project-specific cost, setting up cost, and operational costs. There are few costs which are one time while some are recurring expenses. The costs are incurred on specialists, maintenance staff, structure, upkeep, training, and application software cost. This analysis guarantees that the solution will not surpass the limit of the budget and at the same time, the efficiency is enhanced as the analysis helps in improved utilisation of resources.

b. Technical viability evaluation examines the technical rationality of the projected solution. Technical viability assesses the company's infrastructure and resources containing hardware, software, and network capability to back the application. Along with that an assessment is made about the constancy of the suggested system in relation with the technical necessities of the company's technical resource. Hence, this valuation assures the dependability and capability for the impending advancement.

c. Operational viability assessment evaluates the scope of structural alterations essential to house the projected system. The projected system must be able to resolve the issues pertaining to business and offer improved opportunity for the altered business process. Few arrangements that might arise consist of business process, managing of human resources, and offerings in products and services.

d. Legal and agreement viability must collaborate with the obligations related to the solutions. The lawyers of the Corporate must guarantee that no unlawful practices are being used in the new system and all the regulations are followed. Organizations can get the legal consultants to recheck the viability of the contract and specify the legal liabilities which the companies will have to face, in case they fail to abide to the prescribed regulations.

e. After the thorough analysis is conducted about the viability of the merger, it is essential to analyse the risk factors of the suggested system, the possible coercions, weaknesses, influences, so that the viability of the other factors can help in minimising the threats. Lastly, the company might analyse the human factors and ergonomic elements so that overall well-being of the people can be integrated with whole system's performance. Ergonomic necessities help in reviewing the work environment which is secure and effectual for the workers.

6.7.5 Advantages of Flexibility in Merger and Acquisition

There are many advantages of flexibility in M&A. These are as follows:

- It helps in appreciating the goals of the companies
- It provides scope for deliberated vision and planning essential for success
- It provides executive and top management's support
- Complete justification of finances
- Usage of external capability in decision process
- Transparent communication with consumers
- Vigilant assortment of the dealer
- Regular appraisal of the performances of processes and workers
- It equips the organisation to face the external fluctuations
- Combined resources of the businesses can be used to create a competitive advantage in the market.

6.8 FLEXIBILITY IN STRATEGIC ALLIANCE

The concept of 'strategic alliance' is often referred to as business networks, strategic partnering, collaborative arrangement, cooperative strategy, flexible specialization and linkages. Common understanding of the term can be understood as "significant connotation of interests". The association formed due to strategic alliance is an important agreement for participating partners and is designed to promote their mutual interests. They may comprise of agreements for franchising and licensing, partnership contracts, fresh equity investments or prevailing joint ventures and confederations. An alliance is commonly determined as means of willingly instigated compliant contract among

Check Your Progress

11. State the purpose of Mergers and Acquisitions (M&A).
12. What do you understand by viability analysis in M & A?

companies or businesses and may involve interchange, partaking, or co-development of products and services. These may be in form of capital, technical know-how or assets of the firms. Strategic perception is the basis of all alliances. This perspective may be equal for both the partner or have more relevance for any one. The strategy of such relations has to be cooperative strategy. As the main purpose is to achieve common objectives, the functioning of both the firms have to be based on cooperation. Strategic alliances are deliberate activities planned among two firms and try to fulfil a variety of objectives and purposes.

According to Buttery et.al, the strategic alliances may be defined as "two or more organizations involved in mutually beneficial relationships that maintain all participants as separate corporate entities". It is obvious from the definition that even though participating partners continue with their usual operations in business, they have to combine their abilities and assets primary to the new endeavours so that common benefits can be acquired. Spekman et.al, have further elaborated that even though there are many differences in the operations undertaken by the partners, due to the alliance their goals are compatible with each other. The alliance leads to strategic commitments of and both partners have access to the resources and opportunities of each other for improving their processes and knowledge.

Hence, from the above explanation, it can be stated that strategic alliance is a convenient, long lasting, reciprocally advantageous agreement between associates. Due to this alliance, resources, knowledge and competences are united with the purpose of protecting the competitive place of all the associates involved. Firms mobilise their resources and competences to generate competitive advantage. This helps the associates to use the new technologies of other. Alliances are measured as an important means to create new products and go into the market. The alliances help in increasing the turnover of the partners with fewer investments. Alliances assist in penetrating new markets to use new technologies and accomplish economies of scale quicker and economically than any other technique of acquisition. Small firms can also team up so that they can enhance their activities and share the risk of venture and improve their position in the market.

Alliance can be classified into the three groups; the first is referred to as a joint venture, when businesses align with each other and form an independent legal company. The second group is referred to as equity strategic alliances; the partners have a different ownership percentage in the business. They share resources according to their individual capacities though the main objective of the alliance is same for both. Non-equity strategic alliances is the third group This takes place when agreements are based on contract instead of ownership sharing. These are contracts with a company's suppliers, manufacturers, or distributors, or the contracts may just be for marketing and information sharing purpose.

6.8.1 Need for Flexibility in Strategic Alliance

The strategic alliances have the same agenda for both the partners and they are also working to achieve this agenda. The strategic alliances have to provide flexibility to both the partners so that they are able to perform and take decisions independently.

Flexibility is crucial for following reasons:

1. Vital for the success of the main business goal or objective.
2. Essential for the growth and upkeep of the capabilities and various elements essential for maintaining a competitive advantage.
3. It wedges the threats from competitors.
4. It helps in developing and maintaining the strategies of the company.
5. It diminishes the major risk to the business.

While evolving a strategic alliance it is essential to maintain the flexibility of systems in both the systems so that the partners have the freedom to take decisions best suited for their organizations. The flexibility helps in clarifying the boundaries of control and clearly outlines the expectations of the alliance. The strategic alliance will be useful for the partners if they are based on flexibility.

6.8.2 Level of Flexibility in Strategic Alliances

The relevance and importance of the strategic alliances has already been established here. Moreover, the success of an alliance is based on the level of flexibility in the transactions between the allied companies. Flexibility will reduce the weaknesses and help in gaining competitive advantage. The alliance helps in sharing the risks and knowledge. There is ample opportunity for growth and this requires both the partners to be quick in availing the opportunities which generate due to changes in environment. The flexibility in the alliance will lead to innovations and allow entry in a particular market.

The triumph of most alliances is largely dependent on factors like commitment, understanding, good communication, trust and pressure-free working environment. Strategic Alliances between rigid and unadaptable partners always lead to a failure. These partners are unable to benefit from the alliance as they do not provide flexibilities in their corporate strategies which are essential for the development of products and services. These days several international companies have alliances with internal as well as global partners in the market. Occasionally, the alliances take place between rivals companies. Such alliances, in order to achieve the goals, have to be based on flexible agreements. The flexibility allows them to keep up with the competition as well as protect their personal interests.

6.9 COMPETITIVE EDGE AND FLEXI SYSTEMS

In order to keep the competitors away, secure astonishing progression and profits, businesses must adopt flexible systems. Great progress in business systems is possible with minor changes in the information system of the organization. Flexibility in the business enables a considerable competitive advantage as it strengthens the position in the market. The time cycle of the product becomes less and customized. Flexibility in product motivates to produce products which are different from the existing competition; it leads to constant amendment, tailored-made features. This provides remarkable expansion in the business opportunities. In order to be flexible and acquire a competitive advantage, the managers evolve the business systems according to their intuitions and prior familiarity This is joined with the specialized and methodological knowledge. In order to sustain the competition, the organizations have to become

dynamic and flexible. The performance of the organization is dependent on prompt adjustments made to changes in the environment. Organization's flexibility is diligently associated with how the information systems are managed. Flexible functioning of information system enables the organization to be extra receptive. As a result, it is able to handle external as well as internal changes with efficiency.

The flexibility harbors the complete business chain, beginning from consumer to provider.

6.9.1 Flexibility and the Competitive Edge

A systematic but inflexible organization will not be able to adjust to changes which lead to its failure in fluctuating conditions. It has been stated in "*Organization Theory and Design*," by Richard L. Daft that technological expansions frequently change the showground. In order to maintain the competitive advantage, companies need to recognize methods to integrate the fresh technology into the existing processes. Changes help the flexible organizations to grow, innovate and make the most of the opportunities. According to Corrêa (1992), Hayes and Wheelwright (1984), there are priorities of competition and these are: low cost/price, high performance of products, dependability of delivery and product services, flexibility by providing variety, tailor-made products, quick response and production in short duration. The last priority is the ability to innovate new products and adapt new technology.

Competitive priorities that the producing companies are faced with are following

1. Producing goods at a low cost.
2. Providing the value for the planned costs
3. Enhancing the productivity by optimum utilization of process technology, effort and resources
4. Maintaining the quality and standard of the product
5. Producing a variety of products
6. Designing new products and improved processes
7. Quick response to the demands of the consumer
8. Increasing the speed of delivery speed
9. Adapting the changes in the environment and providing flexibility

6.9.2 Gaining a Competitive Advantage

Competitive advantage confers to the capability of an organization to deliver products and services that are distinct and appealing to the consumers in comparison to the products of the rival companies. This is achieved by adopting flexibility in following aspects of business:

1. Flexible marketing helps in targeting specific customers. Marketing for every product needs different, according to its appeal to the customer, geographic conditions, political, cost-effectiveness, and several other factors. Companies which are not flexible about the methods they adopt for this purpose will not be able to target the particular customers for various products and will lose their competitive edge in the market.

2. Flexibility in purchasing the product should be provided to the customer. The process of procuring the product should be left to the comfort of the user. They could procure the product through the internet, telephone or by shopping in a store. The flexibility in mode of payment is also essential. It can be through cash or cheque or a credit card. The customer should have the option to pay the money in installments as well. In case, a company does not provide these options, the consumer will opt for companies offering this flexibility.
3. Flexible product concept is being embraced by most manufacturers. The company should be able to deliver products as per the specifications provided by the customer. For instance, a toy company should be able to design toys as per the whims and fancies of the child or insurance companies offer tailor-made policies for their consumers. This flexibility makes the customers feel special and derive satisfaction if the product suits their usability. The companies which lack this type of product flexibility will lose their users to the competitors.
4. Flexible customer service after sale of the product is very important as it conveys to the customer that the company cares about their comfort by making sure that the customer is able to correctly use the product. In case of failure in the functioning of the product, the company should offer instant repairs or replacement if the product is in warranty period.
5. Lithe sales personnel are required in present environment. The sales persons not just need to look smart but behave smartly. They should have complete knowledge of the product and be able to convince the consumer that the product is well suited for their needs. The sales people should be able to handle the sales of various products as per the prevailing situation and trends of the market.
5. Flexible shop floor production is required to meet the demands of the current market. The production department has to perform many more tasks than just finishing a day's target. More flexible manufacturing processes like just-in-time production has replaced the traditional manufacturing processes. The production companies get direct specifications about the demands of the customer. The production line should have the available inventory and skill to fulfil the needs and provide the output in time and of expected quality. The practice of automatic systems and application of flexible business practices in various departments is important. Simulated intelligent systems and professional systems are replacing the humans to perform the task with more accuracy. These practices compel organizations to adopt production flexibility so that they are able to maintain their competitive advantage in the market. Flexibility in design of the product with the help of specialists is another aspect of flexible production.
6. Flexible business model requires its work force to be equally flexible. The human resource flexibility has enabled the workers to have flexible hours of working, various styles of working and flexibility in skills. The employees need to be flexible about acquiring new skills and doing a task which is not part of their job profile. Several businesses are outsourcing skilled professionals so that they can keep up with the business processes.
7. Flexible supply chain extends the concept of flexibility to the suppliers. The need for constant renewal of inventory, fluctuating inventory as per the requirements of the customer, makes it essential for flexibility in the supply chain.

The information system has a crucial role to play in this aspect. The IS system helps in communicating the requirements of inventories to the supplier and the production houses.

8. Flexible organization on the whole is required to maintain a competitive edge in the market. None of the above-mentioned aspects can perform flexibly in isolation. All the aspects of the organization have to be flexible for facilitating the functions of one and another. The external environmental changes have an impact on the entire organization and there is a need to adjust the processes of the organization to fully handle the changes and avail the opportunities which become exposed due to these changes. Restructuring will have throughout the organization. The leaders of a company need to be dynamic in their approach so that they are able to develop strategies which can handle some amount of risks.

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6.9.3 Need for New Approach

The requirement to expand the capability in the area of information system has been outlined as an essential element for flexibility and competitive advantage. The information systems needs to develop processes which help in improving the interactions with the consumers. Several companies have round-the-clock efficient call centers which are constantly working to help and register the feedback of the customers. The information system helps in storing data which are used in the designing of the new products. The human resource existing in the company needs to be inspired to work using the technology in the system. They need to have the ability to comprehend the data and employ it to develop beneficial knowledge to manage a constant competitive advantage. Information system needs to preserve the precise knowledge till the time it is needed.

There is a need for innovative approach in strategy planning. Flexibility should be present in the strategies of the organization. It should be able to provide the material necessary for initiating plans which are exclusive and not easy to imitate. These matters comprise of attaining constant improvements and integrating fresh features with the altering needs and applying systematic inventive improvements so that the customers are satisfied. It is essential to realize that strategies will not be able to back a sustained competitive advantage if it is not supported by the human resources of the organization. To utilize the information system as a competitive defense, strategic opportunity of industry must be initiated.

The infrastructural capability of the company should be designed to support the flexible business processes. The infrastructure needs to be comprised of following features:

- Changes should be easily adapted and implemented.
- The infrastructure should not be expensive
- The size of the structure should not be very large and unmanageable
- It should have a strong information system
- The structure should consist of objects which can be easily relocated.

In the fluctuating international financial set-up, most companies are reorganizing their business processes and procedures. In short, the companies are becoming flexible. Flexibility is the magic potion which is required for survival in the competitive market in

Check Your Progress

13. What is the concept of strategic alliance?
14. Enumerate the need for flexibility in strategic alliance.
15. State the role of flexibility in gaining competitive advantage.

current times. The business enterprises, which are not flexible in their processes, are the ones which are unable to adjust to the changing external environment. They are unable to maintain their competitive edge due to lack of flexible systems.

6.10 SUMMARY

- Manufacturing industries are facing many challenges in keeping up with fluctuating market needs. Globalization has completely changed the current market trends. In the present corporate setting, the competitiveness of all manufacturing industry is dependent on its capacity to react promptly to the briskly shifting market and to provide products which are of superior quality at low prices.
- They have to adopt flexible manufacturing systems (FMSs) in the form of an automatic set of mathematically controlled machine tools and material handling systems
- As flexibility is inversely related to the sensitivity to change, a portion of flexibility requires computing the "penalty of change". This is measured by multiplying the penalty with probability so that POC can be figured (POC = penalty x probability).
- The environment in which the organizations have to function currently is full of changes and turmoil. The business processes have to be truly flexible so that they are able to reduce the product cycle duration, handle the global competition, sustain an increasingly controlling environment and provide products which are dynamic and cost effective at the same time.
- Business process improvement (BPI) and total quality management (TQM) are illustrations of initiatives taken by the organization to enhance technology flexibility and these highlight adaptation.
- Flexible product development is the ability to make changes in the way the product is developed in the design stage as well as later in the process. The changes are made without disrupting the other components of the product. The level of flexibility helps in implementing changes with less disruption.
- Creating flexibility in service offerings takes into account several factors such as the level of maturity of the company, enthusiasm towards taking risk, competitive advantage and strategic objectives. The level is decided on the basis of its performance, safety, needs of the consumers and its usability for them.
- Business Excellence (BE) is focused on evolving and supporting the management systems and processes of an organization so that efficiency can be improved and more value can be generated for the stakeholders.
- The objective of M&A is usually for two companies to generate enhanced value and performance. These companies merge as they are unable to perform well independently. The aim is to maximise wealth and improve the scope of innovations and strengthen the market position.
- The concept of "strategic alliance" is often referred to as business networks, strategic partnering, collaborative arrangement, cooperative strategy, flexible specialization and linkages. Common understanding of the term can be understood

as "significant connotation of interests". The association formed due to strategic alliance is an important agreement for participating partners and is designed to promote their mutual interests

- While evolving a strategic alliance, it is essential to maintain the flexibility of systems in both the systems so that the partners have the freedom to take decisions best suited for their organizations.
- In order to be flexible and acquire a competitive advantage, the managers evolve the business systems according to their intuitions and prior familiarity. This is joined with the specialized and methodological knowledge.
- Flexible business model requires its work force to be equally flexible. The human resource flexibility has enabled the workers to have flexible hours of working, various styles of working and flexibility in skills. The employees need to be flexible about acquiring new skills and doing a task which is not part of their job profile.

6.11 ANSWERS TO 'CHECK YOUR PROGRESS'

1. Manufacturing industries are facing many challenges in fluctuating market needs. Globalisation has completely changed the current market trends. In the present corporate setting the competitiveness of all manufacturing industry is dependent on its capacity to react promptly to the briskly shifting market and to provide products which are of superior quality at low prices.
2. A manufacturing system needs to have the following competences:
    - Recognising various production units which will be able to execute the exact operation
    - Fast conversion of functioning instructions to the automatically controlled production machines
    - Fast conversion of physical systems of fittings, tools and other working units
3. The components of flexi systems are:
    - Machine flexibility
    - Production flexibility
    - Mix flexibility
    - Product flexibility
    - Routing flexibility
    - Volume flexibility
    - Expansion flexibility
4. In order to achieve flexibility in technology, it is essential to understand the prevailing environment as it helps in defining form of the nature of change essential of a technology to support the business process. Unsettled environments are capable of reorganising the structures in the organisation and bring about changes in the processes or completely do away with the process.
5. Information Technology (IT) has applied flexibility in three areas: flexibility in functionality, flexibility in use, and flexibility in modification. Flexibility in

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functionality and modification deal with the adjustments made because of incremental change or inconsistency. Flexibility in use deals with the incremental changes as well as its capabilities to incorporate fresh relations and openings.

6. Flexible product development is the ability to make changes in the way the product is developed in the design stage as well as later in the process. The changes are made without disrupting the other components of the product. The level of flexibility helps in implementing changes with less disruption.
7. Capacity flexibility must be given emphasis as it permits the businesses to take the following steps:
   - Alter the volume of production as per the demands of the consumers.
   - Enable production of various products using the same machines so that the demand can be adjusted as per the needs of the consumers.
   - Change product technology and process technology to preserve or increase an organization's competitive situation
8. Creating flexibility in service offerings takes into account several factors such as the level of maturity of the company, enthusiasm towards taking risk, competitive advantage and strategic objectives. The level is decided on the basis of its performance, safety, needs of the consumers and its usability for them.
9. Business Excellence (BE) is focused on evolving and supporting the management systems and processes of an organization so that efficiency can be improved and more value can be generated for the stakeholders. Business excellence is not just limited to establishing systems which are of high quality; its scope covers every aspect of the organization. The excellence has to be reflected in management, approaches, customer focus, controlling information, workers, and processes and essentially on attaining higher business outcomes.
10. Some elements of business excellence are as follows:
    - **Farsighted leadership**: The top management of the organization should be capable of setting directions and generate a customer focus, vibrant and observable structural values, and high potentials for the staff.
    - **Customer-driven excellence**: The customers of the organisation judge the quality and the efficiency. Hence, the organization needs to take be considerate towards the features and the nature of the product from the customer's point of view so that the product is valuable of the customer.
    - **Training and knowledge sharing**: The staff of the organization can achieve high levels of performance only if they are completely knowledgeable about the approaches of the organisation.
    - **Appreciating staff members and associates**: An establishment's triumph rests on its workforce who is efficient and well-guided.
11. All mergers and acquisitions have one common goal: they are all meant to create synergy that makes the value of the combined companies greater than the sum of the two parts. The success of a merger or acquisition depends on whether this synergy is achieved.

12. Both the companies must undertake a viability analysis before entering into a deal with each other. It is essential to recognise the technical and business limitations for each alternate. Viability analysis includes the following classifications: Economic viability analysis, technical viability evaluation, Operational viability assessment and Legal and agreement viability.
13. The concept of "strategic alliance" is often referred to as business networks, strategic partnering, collaborative arrangement, cooperative strategy, flexible specialization and linkages. Common understanding of the term can be understood as "significant connotation of interests".
14. The strategic alliances have the same agenda for both the partners and they are also working to achieve this agenda. The strategic alliances have to provide flexibility to both the partners so that they are able to perform and take decisions independently.
15. In order to maintain the competitive advantage, companies need to recognize methods to integrate the fresh technology into the existing processes. Changes help the flexible organizations to grow, innovate and make the most of the opportunities. Competitive advantage allows an organization to deliver products and services that are distinct and appealing to the consumers in comparison to the products of the rival companies. This is achieved by adopting flexibility in different aspects of business.

6.12 QUESTIONS AND EXERCISES

Short-Answer Questions

1. Enumerate the various competences that companies use to remain competitive in the market.
2. Write a brief note on flexibility in technology.
4. Write a short note on designing a flexible service delivery model.
5. State the areas which need flexibility to establish the business excellence model.
6. Enumerate the role of flexibility in mergers and acquisitions.
7. Why is flexibility considered crucial for strategic alliance?
8. Write a brief note on 'priorities of competition' as coined by Hayes and Wheelwright.

Long-Answer Questions

1. Discuss why firms need flexible manufacturing technology in present day market setting.
2. Enumerate the role of components in flexi system.
3. Elaborate the important role played by flexibility in technologies to bring about changes in the business environment.

NOTES

4. Write a comprehensive note on the contribution of flexibility in product and service offerings to maintain a competitive advantage.
5. Analyse the significant role of business excellence model for assessment of organization's strength.
6. Discuss the various forms of M&A and the need of flexibility in M&A.
7. Elaborate the significance of flexibility in strategic alliance.